**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

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| Appellant: | LOT 3 ACQUISITION FOUNDATION, LLC |
| Serial No.: | 09/823,508 |
| Filing Date: | March 29, 2001 |
| Title: | VIDEO SURVEILLANCE VISUAL RECOGNITION |
| Examiner: | Tung T. Vo |
| Art Unit: | 2621 |
| Conf. No.: | 9844 |
| Attorney Docket No.: | 84022.0136 |

TO: Mail Stop APPEAL BRIEF-PATENTS
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

## APPELLANT'S BRIEF PURSUANT TO 37 C.F.R. § 41.37

Dear Commissioner,

Appellant appeals the decision of the Examiner finally rejecting all pending claims 74-98 in the subject patent application and files this appeal brief under 37 C.F.R. § 41.37 within two months from the date of filing the Notice of Appeal under § 41.31.

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## I. REAL PARTY IN INTEREST

The subject patent application was assigned by inventor Irene V. Hu to co-inventor Dennis S. Fernandez on June 8, 2004. The initial assignment was recorded on August 3, 2004 at Reel/Frame 015648/0927. A corrective assignment was recorded on March 8, 2005 at Reel/Frame 016344/0021. The subject patent application was assigned by Dennis S. Fernandez to Lot 3 Acquisition Foundation, LLC on May 16, 2007. The assignment was recorded on July 3, 2007 at Reel/Frame 019515/0553. Therefore, Lot 3 Acquisition Foundation, LLC is the real party in interest in the subject patent application.

## II. RELATED APPEALS AND INTERFERENCES

### A. Appeal No. 2008-1056

Prior to the assignment to Lot 3 Acquisition Foundation, LLC, a Notice of Appeal was filed in the subject application on October 11, 2006. The appeal was assigned Appeal No. 2008-1056. On September 3, 2008, the Board of Patent Appeals and Interferences ("Board") issued a Decision on Appeal reversing the Examiner as to all appealed claims 68-73. Certain issues in the Decision on Appeal are directly relevant to the present appeal, and Appellant briefly addresses those issues here.

The following language from then-pending claim 68 was addressed by the Board: "automatically enabling such video surveillance of the mobile buyer to be performed automatically by the software having adaptive personal-image visual recognition ability automatically to provide computer implemented visual recognition indication of a personal image of such mobile buyer" (referred to by the Board as the "personal-image recognizing limitation"). With respect to this language, the Board stated:

> We cannot find a factually sufficient disclosure of the personal-image recognizing limitation within Hollenberg [U.S. 6,091,956]. At best, Hollenberg proposes a

> situational information system where digital photographs or video recordings of traffic congestion and emergency-situation information could be transmitted with camera and communication capabilities. ***However, this is not a teaching of the personal-image recognizing limitation required in the claims on appeal*** . . .For these reasons, the Examiner has not established that the personal-image recognizing limitation claimed on appeal is known in the art.

(Board Dec. at 5; emphasis added). The Board concluded, "the Examiner has not established that the personal-image recognizing limitation claimed on appeal is known in the art. Therefore, the skilled artisan could not have found it obvious to include the personal-image recognizing limitation from Hollenberg in the method and structure proposed by Fan" (Board Dec. at 5).

Appellant notes that, where the Board reverses all rejections, as was the case in the previous appeal, **"The examiner should never regard such a reversal as a challenge to make a new search to uncover other and better references."** M.P.E.P. § 1214.04. The present application has been pending for over 8 years, and the present Examiner is the original examiner assigned to this Application. However, after the previous appeal, the Examiner issued a new office action, citing a ***new*** reference (Hull et al., U.S. Patent No. 5,806,005), in rejecting Applicants' claims. It should be noted that the Examiner eventually agreed that this new reference did not render Applicants' claims unpatentable (the Examiner withdrew the rejection based on Hull and cited another ***new*** reference, Wren, U.S. Patent No. 6,055,514, in finally rejecting the claims). Thus, the Examiner should have allowed the application after the previous appeal.

Applicants respectfully, but strenuously assert that such a rejection after the Board's previous decision was improper, because the Examiner's initial search should have revealed Hull and Wren, and if the Examiner believed Hull and/or Wren to be stronger than Hollenberg, the Examiner should have instead cited Hull and/or Wren ***prior to the appeal*** on which the Board's decision was based.

By delaying citation of these new references, the Examiner essentially nullified Applicants' and the Board's time, effort and expense with respect to the previous appeal. At this point, Appellant expects that if the Examiner is ***again*** reversed, the Examiner will ***again*** reopen prosecution by citing another reference that does not render Applicants' claims unpatentable. As such, Appellant respectfully requests that if the Board again reverses the Examiner, that the Board instruct the Examiner to issue a Notice of Allowance.

**B. Appeal 2008-1046**

Prior to assignment to Lot 3 Acquisition Foundation, LLC, a Notice of Appeal was filed in Application Serial No. 09/823,089 on April 12, 2006.[1] The appeal was assigned Appeal No. 2008-1046. On September 29, 2008, the Board issued a Decision on Appeal affirming the Examiner in part, but reversing the Examiner with respect to claims 43 and 58

Claims 43 and 58 recited a "group of cellphones chatting privately in multi-case mode using an embedded watermark or digital certificate." Reversing the Examiner, the Board held:

> We cannot find a factually sufficient disclosure of using an embedded watermark or digital certificate within Heiskari [U.S. Patent No. 5,930,723]. The terms watermark and digital certificate have established meanings in the art, which are not encompassed by the showings in Figs. 5 and 7 and the accompanying disclosure in Heiskari. For example, it is well known that an embedded watermark is an invisible watermarking, which is information added as digital data to audio, picture or video, but which cannot be perceived as such. An application of digital watermarking could be where two parties communicate a secret message embedded in a digital signal. On the other hand, digital certificates are specialized computer security methods that comprise public-key cryptography technology that are attestations by a certificate authority as to the pairing of identification and public key information. Such an embedded watermark or digital certificate is not found or described in Figs. 5 and 7 and the accompanying disclosure in Heiskari.

(Board Dec. at 14.) The Board's decision in this appeal is relevant to the analysis set forth below with respect to certain appealed claims.

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[1] Application 09/823,089 is a Divisional application of Application Serial No. 09/045,412 (U.S. Patent No. 6,697,103), of which the present Application 09/823,508 is also a Divisional.

## III. STATUS OF CLAIMS

Claims 74-98 are pending in the application, of which claims 74, 90, and 95 are independent claims. Claims 74, 90, and 95 are rejected under 35 U.S.C. § 112, first paragraph. Claims 74-98 are rejected under 35 U.S.C. § 103(a). Claims 1-73 were previously cancelled. All claims 74-98 are being appealed.

## IV. STATUS OF AMENDMENTS

No amendment has been filed subsequent to the final rejection.

## V. SUMMARY OF CLAIMED SUBJECT MATTER

Independent claim 74 is directed to a method that includes "recognizing an image of a buyer"[2] associated with a "mobile buyer unit"[3] and sending a portion of a "first transaction message"[4] to a "fixed vendor"[5] in response[6] to recognizing the image of the buyer. The fixed vendor is selected[7] in response[8] to the first transaction message being received from the mobile buyer unit that is configured to "communicate with a network."[9] The image of the buyer is recognized by comparing it "to a stored image of the buyer."[10] A "visual analyzer module"[11] "recognizes the image of the buyer" using "neural-based software" and/or "adaptive learning software."[12]

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[2] See, e.g., ¶¶ [0023]-[0024], [0058]-[0059], [0084]-[0090] and [0095]-[0096] [0099], [0105]-[0107], [0117], and [0122]. Citations throughout using "¶", unless otherwise indicated, are to paragraphs in U.S. Patent Application Pub. No. 2001/0029613.
[3] See, e.g., ¶¶ [0019]-[0022], [0029], [0084]-[0090], [0095]-[0096], [0126] and FIGS. 1-2.
[4] See, e.g., ¶¶ [0084]-[0090], [0095]-[0096] and [0128]
[5] See, e.g., ¶¶ [0019]-[0022], [0084]-[0090], [0095]-[0096], [0099] and [0125].
[6] See, e.g., ¶¶ [0084]-[0090].
[7] See, e.g., ¶¶ [0054]-[0056], [0084]-[0090], [0095]-[0096], [0105]-[0107], and [0110].
[8] See, e.g., ¶¶ [0084]-[0090].
[9] See, e.g., ¶¶ [0013] and [0017].
[10] See, e.g., ¶¶ [0089]-[0090] and [0099].
[11] See, e.g., ¶¶ [0099], [0105]-[0107], [0117], and [0122] and FIG. 3.
[12] See, e.g., ¶¶ [0054]-[0056], [0099], [0105]-[0107], [0117], and [0122].

Independent claim 90 is directed to a "controller"[13] that comprises a "processor,"[14] a "visual analyzer module,"[15] and a "communicator"[16] that sends "a portion of [a] first transaction message to [a] fixed vendor in response to the visual analyzer module recognizing an image of [a] buyer."[17] The processor utilizes "software to select a fixed vendor in response to [the] first transaction message [being] received from a mobile buyer unit." As noted above, the visual analyzer module recognizes the image of the buyer using neural-based software and/or adaptive learning software.

Independent claim 95 is directed to a "mobile buyer unit" as described above. The mobile buyer unit comprises a "detector"[18] and a "communicator"[19] that sends "[an] image of [a] buyer and a first transaction message to a controller via a network." The detector "records an image of a buyer associated with a mobile buyer unit." The controller comprises a "visual analyzer module" that recognizes the image of the buyer by comparing the image of the buyer to a stored image of the buyer using neural-based software and/or adaptive learning software.

No means plus function or step plus function claims under 35 U.S.C. § 112, sixth paragraph are being appealed.

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[13] See, e.g., ¶¶ [0015]-[0016], [0031], [0034]-[0036], [0047]-[0049] and FIGS. 1, 3.
[14] See, e.g., ¶¶ [0015]-[0019], [0031], [0034]-[0036], [0047]-[0049] and FIG. 3.
[15] Where support for elements has already been shown, it will not be repeated.
[16] See, e.g., ¶¶ [0017]-[0019], [0028], [0041] and FIGS. 1,3.
[17] For claims 90 and 94, see support shown with respect to claim 74.
[18] See, e.g., Sensor 44 of FIG. 1 and ¶¶ [0032]-[0033].
[19] See, e.g., Communicator 46 of FIG. 1 and ¶¶ [0034]-[0036].

## VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

A. Whether independent claims 74, 90 and 95 are unpatentable under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement.

B. Whether claims 74-79 and 82-97 are unpatentable under 35 U.S.C. § 103(a) over Wren, U.S. Patent No. 6,055,514 ("Wren").[20]

C. Whether claims 80-81 and 98 are unpatentable under 35 U.S.C. § 103(a) over Wren.[21]

## VII. ARGUMENT

Appellant respectfully requests that the Board reverse the Examiner's 35 U.S.C. §§ 112 and 103(a) rejections. Appellant notes that, even if the Board sustains the Examiner with respect to the 35 U.S.C. § 112 rejection, the Board should nonetheless reverse the Examiner with respect to the 35 U.S.C. § 103(a) rejections because Appellant does not rely on the claim language rejected under § 112 to argue against the § 103(a) rejections.

### A. Rejection under 35 U.S.C. § 112, first paragraph, of claims 74, 90 and 95

The Examiner rejects claims 74, 90, and 95 under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement, because the "specification does not exactly disclose 'comparing the image of the buyer to a stored image of the buyer'" (Final Office Action, page 2). Appellant respectfully disagrees.

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[20] In the Final Office Action dated July 9, 2009, the Examiner only cites Wren in rejecting these claims under § 103(a). However, in the Examiner's argument, the Examiner also mentions "Bonneau, Jr." which is presumably U.S. Patent No. 5,581,630, but it does not appear the 103(a) rejection is based on Bonneau, Jr.

[21] In the Final Office Action dated July 9, 2009, the Examiner only cites Wren in rejecting these claims under § 103(a). However, in the Examiner's argument, the Examiner also mentions "Fan" which is presumably Fan et al., U.S. Patent No. 5,959,577 that was cited in the prior Office Action, but it does not appear the 103(a) rejection is based on Fan.

First, ***identical language is not a requirement***, and instead, to "satisfy the written description requirement, a patent specification must describe the claimed invention in sufficient detail that one skilled in the art can reasonably conclude that the inventor had possession of the claimed invention. . . . The issue raised in the cases is most often phrased as whether the original application provides '***adequate support***' for the claims at issue." M.P.E.P. § 2163(I) (emphasis added). "The fundamental factual inquiry is whether the specification conveys with ***reasonable clarity*** to those skilled in the art that, as of the filing date sought, applicant was in possession of the invention." *Id.* § 2163(I)(B) (emphasis added). Therefore, Appellant respectfully requests that the Board reverse the Examiner's rejection under 35 U.S.C. § 112, first paragraph, because the Examiner applied the incorrect standard for the written description requirement.

Additionally, Appellant respectfully submits that the specification fulfills the written description requirement under the appropriate standard. At least the portions of the specification cited below provide "adequate support" and "reasonable clarity" for "comparing the image of the buyer to a stored image of the buyer" as recited in claim 74, and as similarly recited in claims 90 and 95.

The specification states, "Visual analyzer module 168 . . . functions programmably to process, preferably in multi-dimensions, digital ***image*** or video information to attempt to recognize, ***store***, ***compare***, or otherwise process ***visually observed information*** regarding ***monitored objects***" (¶ [0099]; emphasis added). Thus the visual analyzer module is capable of storing and comparing visually observed information, including digital image or video information, regarding monitored objects. "For example, module 168 may serve object image queries and attempt to recognize, ***retrieve from image database***, or otherwise capture image of

***person*** or object associated with target unit 4 determined recently to have entered detector observation scope" (¶ [0099]; emphasis added).

Furthermore, the specification is clear that the "monitored objects" may be buyers and/or consumers: "such [an] integrated system for enabling remote object surveillance-based commercial transaction is preferably achieved by considering potential ***buyer*** or object movement relative to fixed or mobile resources . . . For example, using [the] integrated system . . . for obtaining certain commercial data, or actually completing [a] transaction, improves [the] likelihood of matching mobile ***consumer*** wants or needs with nearby product or service resources" (¶ [0090]; emphasis added). "Hence . . . improved electronic commercial transaction methodology is provided generally such that one or more potential ***buyers*** and one or more potential sellers . . . communicate digitally through [the] Internet or other substantially equivalent networking facilities" (¶ [0089]; emphasis added).

Therefore "adequate support" and "reasonable clarity" for "comparing the image of the buyer to a stored image of the buyer" as recited in claim 74, and as similarly recited in claims 90 and 95, is found in the specification. For this additional reason, Appellant respectfully requests that the Board reverse the Examiner's rejection under 35 U.S.C. § 112.

**B. Rejection under 35 U.S.C. § 103(a) over Wren (and possibly Bonneau, Jr.)**

*Claims 74, 76, 78-79, 82-83, 85-89, and 95-97*

Wren does not disclose or contemplate a method comprising "selecting a fixed vendor in response to a first transaction message." Wren discloses that a "system for shopping for goods and services includes central communications facilities and remote communications facilities connected by communications links and permitting data communications between them" (Wren, Abstract). "At the remote facility . . . ***[t]he customer presses an auto dial button*** 44 on the

speaker phone 20 or uses his input device such as a touch screen ***to select*** a central facility to contact from a list displayed on his monitor and in doing so ***establishes contact*** with the financial services company . . . by way of some means of ***transmitting*** data, audio, and/or visual ***information***" (Wren 13:8-18[22]; emphasis added). Therefore, not until the customer "select[s] a central facility," does any transmission of data from the remote communication facility occur. Wren is silent with respect to any "transaction message" that occurs ***prior*** to the customer's selection of a central facility. Therefore, Wren does not disclose or contemplate "selecting a fixed vendor ***in response to*** a first transaction message" as recited in claim 74 (emphasis added) and as similarly recited in independent claim 95.

Furthermore, Wren does not disclose or contemplate "a visual analyzer module [that] recognizes the image of the buyer using at least one of neural-based software or adaptive learning software." Nowhere does Wren mention "neural-based software or adaptive learning software," and the Examiner does not cite another reference to show this element of claim 74, nor similar elements in claim 95. Therefore, Appellant respectfully requests that the Board reverse the Examiner's rejection of claims 74 and 95.

The Examiner mentions Bonneau, Jr. (U.S. Patent No. 5,581,630) in passing with respect to "neural-based software or adaptive learning software," but Appellant respectfully submits that Bonneau, Jr. does not disclose or contemplate "neural-based software or adaptive learning software." The phrase "Adaptive CCD Imager" appears on FIG. 3 of Bonneau, Jr., but nowhere is "neural-based" or "adaptive ***learning***" software disclosed or described in Bonneau, Jr., and nowhere does Bonneau, Jr. disclose or contemplate that Bonneau, Jr.'s "Adaptive CCD Imager" "recognizes the image of the buyer," as recited in claim 74 and as similarly recited in claim 95.

[22] The notation X:Y used herein denotes the column (X) and line (Y) in the cited reference.

With respect to the Examiner's apparent rationale for citing Bonneau, Appellant refers to the Board's previous Decision on Appeal: "Hollenberg proposes a situational information system where digital photographs or video recordings of traffic congestion and emergency-situation information could be transmitted with camera and communication capabilities. However, ***this is not a teaching of the personal-image recognizing limitation required in the claims on appeal*** . . . For these reasons, the Examiner has not established that the personal-image recognizing limitation claimed on appeal is known in the art" (Board Dec. at 5; emphasis added). Even though Bonneau may be capable of capturing images with its "Adaptive CCD Imager," Bonneau merely discloses image processing (*see, e.g.,* Bonneau, Jr. 4:16-45), Bonneau, Jr. is silent with respect to "recognizing an image of a buyer" as recited in claim 74 and as similarly recited in claim 95.

Claims 76, 78-79, 82-83, 85-89, and 96-97 variously depend from independent claims 74 and 95. Therefore, Appellant asserts that dependent claims 76, 78-79, 82-83, 85-89, and 96-97 are patentable for at least the same reasons stated above for differentiating independent claims 74 and 95, as well as in view of their own respective features. Appellant thus requests that the Board reverse the Examiner's rejection of claims 74, 76, 78-79, 82-83, 85-89, and 95-97.

*Claim 75*

Wren discloses that "[o]ther means to verify identification of the customer can be used comprising magnetically encoded badges or cards, or the use of eye or finger scanning devices" (Wren 12:30-32). However, Wren is silent with respect to, and therefore does not disclose or contemplate, "sending . . . an ***image recognition confirmation*** to the fixed vendor" as recited in claim 75 (emphasis added). At most, Wren may be interpreted to send data from the "eye or finger scanning devices," but there is no disclosure in Wren about sending "an image recognition

confirmation." For at least that reason, Appellant respectfully submits that the cited references do not disclose or contemplate all the elements of claim 75, and Appellant respectfully requests that the Board reverse the Examiner's rejection of claim 75.

*Claim 77*

The Examiner asserts that the "first transaction message" in claim 77 reads on disclosure in Wren at 13:9-31 and/or 14:5-28 (Final Office Action, page 4). However, all of this cited disclosure in Wren occurs ***after*** the consumer selects a "central facility." For example, the customer first "uses his input device . . . to select a central facility to contact from a list displayed on his monitor and in doing so ***establishes contact with the financial services company***" (Wren, 13:14-17; emphasis added). Therefore, everything that occurs in the sections cited by the Examiner occurs ***after*** the selection of the central facility. In contrast, Applicant's claim explicitly recites "selecting a fixed vendor ***in response*** to a first transaction message" (claim 74; emphasis added). Thus, anything in Wren that occurs after the selection of the central facility does not disclose or contemplate Applicant's "first transaction message," as recited in claim 74 and similarly in claim 77.

Furthermore, the Examiner's asserted "first transaction message" in Wren does not disclose or contemplate "wherein the first transaction message comprises an offer to buy at least one of a good or a service," as recited in claim 77. Rather, Wren discloses that after the customer establishes contact with the central facility, "the customer can automatically review established presentations to better prepare him for a session with a representative and to educate the customer on the goods and services ***he is about to consider***" (Wren, 13:24-28; emphasis added). Thus, at the time of the Examiner's alleged "first transaction message," the customer has not yet made a purchasing decision, and Wren cannot therefore disclose or contemplate "wherein

the first transaction message comprises an offer to buy." Appellant therefore respectfully requests that the Board reverse the Examiner's rejection of claim 77.

*Claim 84*

Regarding claim 84, the Examiner states, "encoded badges or cards obviously include[] a digital image and a digital certificate for security purposes" (Final Office Action, page 5), and the Examiner cites Wren at 12:30-32 for support. That section of Wren states, "Other means to verify identification of the customer can be used comprising magnetically encoded badges or cards, or the use of eye or finger scanning devices." Appellant respectfully submits that the Examiner has not presented a factual basis for the rejection of claim 84.

For example, assuming for the sake of argument that Wren does disclose that the "encoded badges or cards . . . include[] a digital image and digital certificate," such an interpretation of Wren still does not render claim 84 obvious. Neither Wren nor the other cited references, alone or in combination, disclose or contemplate, "wherein ***the image of the buyer*** is a digital image that ***comprises*** at least one of an embedded watermark or a digital certificate" (emphasis added). Even if Wren's "encoded badges" include a "digital image and a digital certificate," the Examiner does not assert that Wren discloses an "image" that ***comprises*** an "embedded watermark" or a "digital certificate," and Appellant therefore respectfully requests reversal of the rejection of claim 84 because the Examiner has not established a factual basis for the rejection of claim 84.

Moreover, it appears the Examiner is attempting the same type of argument he attempted in above-referenced Appeal No. 2008-1046. In that Appeal, the Board found that "the skilled artisan could not have found it obvious to include a group of cellphones chatting privately in multi-case mode using an embedded watermark or digital certificate from Heiskari in the method

and structure proposed by DeLorme, because Heiskari does not disclose or suggest this limitation" (Board Dec. at 14.) Similarly, the Examiner here has not provided a factual basis for the "embedded watermark" or "digital certificate" elements on appeal because none of the cited references disclose these elements.

*Claims 90-91 and 93-94*

Claim 90 recites a "visual analyzer module." In rejecting this element of claim 90, the Examiner cites Wren at 12:30-32 (full language of this citation provided above) and states, "The use of eye or finger scanning ***devices*** . . . obviously includes a module for comparison" (Final Office Action, page 6) (emphasis added). However, as noted above, Appellant respectfully submits that neither this section, nor any other section of Wren discloses or contemplates a "visual analyzer module" or any "module for comparison."

Furthermore, Wren does not disclose or contemplate, alone or in combination with the cited references, "a communicator configured to send at least a portion of the first transaction message to the fixed vendor ***in response to*** the visual analyzer module recognizing the image of the buyer" (claim 90; emphasis added). In fact, the Examiner provides no support in the Final Office Action for his assertion that Wren discloses this element of claim 90 (*see* Final Office Action, page 6). As noted above, not until Wren's customer "select[s] a central facility," does any transmission of data from the remote communication facility occur. Wren is silent with respect to any "transaction message" that occurs ***prior*** to the customer's selection of a central facility. Therefore, Wren does not disclose or contemplate all the elements of claim 90, and Appellant respectfully requests that the Board reverse the Examiner's rejection of claim 90.

Claims 91 and 93-94 depend from independent claim 90. Therefore, Appellant asserts that dependent claims 91 and 93-94 are patentable for at least the same reasons stated above for

differentiating independent claim 90, as well as in view of their own respective features. Appellant thus requests that the Board reverse the Examiner's rejection of claims 90-91 and 93-94.

*Claim 92*

Neither Wren nor the other cited references, alone or in combination, disclose or contemplate "a visual analyzer module configured to recognize an image of a buyer" (claim 90), "wherein the image of the buyer comprises a video image of the buyer" (claim 92). The Examiner asserts that "the camera enables to capture [*sic*] a video image of the buyer" (Final Office Action, page 7), but the Examiner does not assert that Wren discloses image recognition of the video image. For at least that reason, Appellant respectfully requests that the Board reverse the Examiner's rejection of claim 92.

**C. Rejection under 35 U.S.C. § 103(a) over Wren (and possibly Fan)**

Claims 80, 81 and 98 variously depend from independent claims 74 and 95. Therefore, Appellant asserts that dependent claims 80, 81 and 98 are patentable for at least the same reasons stated above for differentiating independent claims 74 and 95, as well as in view of their own respective features. Thus, Appellant respectfully requests that the Board reverse the Examiner's rejection of claims 80, 81 and 98.

**D. Conclusion**

In conclusion, Appellant respectfully requests that the Board reverse the Examiner's 35 U.S.C. §§ 112 and 103(a) rejections as to all pending claims 74-98.

Respectfully submitted,

Dated: 12/2/09

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## VIII. CLAIMS APPENDIX

1-73. (Canceled).

74. (Rejected) A method, comprising:

selecting a fixed vendor in response to a first transaction message received from a mobile buyer unit configured to communicate with a network;

recognizing an image of a buyer associated with the mobile buyer unit by comparing the image of the buyer to a stored image of the buyer, wherein a visual analyzer module recognizes the image of the buyer using at least one of neural-based software or adaptive learning software; and

sending at least a portion of the first transaction message to the fixed vendor in response to the recognizing the image of the buyer.

75. (Rejected) The method of claim 74, further comprising sending the image of the buyer and an image recognition confirmation to the fixed vendor.

76. (Rejected) The method of claim 74, further comprising sending, to the mobile buyer unit, a second transaction message associated with the fixed vendor.

77. (Rejected) The method of claim 76, wherein the first transaction message comprises an offer to buy at least one of a good or a service, and wherein the second transaction message comprises at least one of a counter-offer or an acceptance to sell at least one of the good or the service.

78. (Rejected) The method of claim 76, further comprising facilitating a transaction between the mobile buyer unit and the fixed vendor in response to the first transaction message and the second transaction message.

79. (Rejected) The method of claim 74, further comprising selecting the fixed vendor in response to the fixed vendor providing at least one of a vendor service or a vendor product that matches a mobile buyer interest.

80. (Rejected) The method of claim 74, further comprising determining a first location of the mobile buyer unit and selecting the fixed vendor in response to at least one of the fixed vendor being near the first location of the mobile buyer unit, or the fixed vendor being near a second location to which the mobile buyer unit will be moving.

81. (Rejected) The method of claim 74, further comprising selecting the fixed vendor in response to at least one of a pattern of mobile buyer unit movement, a previous mobile buyer unit location, or a previous mobile buyer unit transaction message.

82. (Rejected) The method of claim 76, wherein the second transaction message comprises at least one of a fixed vendor real-time inventory listing, fixed vendor service information, fixed vendor good information, a fixed vendor location, directions to the fixed vendor location, or location-based pricing of at least one of a vendor product or a vendor service.

83. (Rejected) The method of claim 74, wherein the mobile buyer unit is a cellular phone configured to communicate with the network via a wireless communicator.

84. (Rejected) The method of claim 74, wherein the image of the buyer is a digital image that comprises at least one of an embedded watermark or a digital certificate configured to facilitate security of the digital image.

85. (Rejected) The method of claim 74, wherein the mobile buyer unit comprises a detector configured to record the image of the buyer.

86. (Rejected) The method of claim 74, further comprising delivering at least one a solicited product, a solicited service, an unsolicited product, or an unsolicited service to the mobile buyer

unit in an electronic format in response to the sending at least the portion of the first transaction message to the fixed vendor.

87. (Rejected) The method of claim 74, further comprising delivering an electronic document to the mobile buyer unit in response to the sending at least the portion of the first transaction message to the fixed vendor.

88. (Rejected) The method of claim 74, wherein the image of the buyer is received from the mobile buyer unit.

89. (Rejected) The method of claim 74, wherein the image of the buyer is received from a fixed detector distinct from the mobile buyer unit.

90. (Rejected) A controller comprising:

a processor configured to utilize software to select a fixed vendor in response to a first transaction message received from a mobile buyer unit configured to communicate with a network;

a visual analyzer module configured to recognize an image of a buyer using at least one of neural-based software or adaptive learning software, wherein the visual analyzer module is configured to recognize the image of the buyer by comparing the image of the buyer to a stored image of the buyer; and

a communicator configured to send at least a portion of the first transaction message to the fixed vendor in response to the visual analyzer module recognizing the image of the buyer.

91. (Rejected) The controller of claim 90, wherein the image of the buyer comprises a still image of the buyer.

92. (Rejected) The controller of claim 90, wherein the image of the buyer comprises a video image of the buyer.

93. (Rejected) The controller of claim 92, wherein the video image of the buyer comprises an audio component, and wherein the visual analyzer module is further configured to generate audio recognition information associated with the video image of the buyer.

94. (Rejected) The controller of claim 90, wherein the communicator is configured to receive the image of the buyer from a fixed detector configured to observe the buyer.

95. (Rejected) A mobile buyer unit, comprising:

a detector configured to record an image of a buyer associated with a mobile buyer unit; and

a communicator configured to send the image of the buyer and a first transaction message to a controller via a network, wherein the controller comprises a visual analyzer module configured to recognize the image of the buyer by comparing the image of the buyer to a stored image of the buyer using at least one of neural-based software or adaptive learning software, and wherein the communicator is further configured to select a fixed vendor in response to the first transaction message and send at least a portion of the first transaction message to the fixed vendor in response to the visual analyzer module recognizing the image of the buyer.

96. (Rejected) The mobile buyer unit of claim 95, wherein the communicator is further configured to receive a second transaction message in response to the fixed vendor receiving the first transaction message and a buyer image recognition confirmation.

97. (Rejected) The mobile unit of claim 95, wherein the mobile buyer unit is a cellular phone and the buyer is a cellular phone user.

98. (Rejected) The mobile unit of claim 97, wherein the cellular phone comprises a locator configured to facilitate a determination of a cellular phone user location.

## IX. EVIDENCE APPENDIX

Copies of:

Bonneau, U.S. Patent No. 5,581,630

Fan et al., U.S. Patent No. 5,959,577

Heiskari, U.S. Patent No. 5,930,723

Hollenberg, U.S. Patent No. 6,091,956

Hull et al., U.S. Patent No. 5,806,005

Wren, U.S. Patent No. 6,055,514

M.P.E.P. §§ 1214.04 and 2163(I)

US005581630A

# United States Patent [19]

**Bonneau, Jr.**

[11] **Patent Number: 5,581,630**

[45] **Date of Patent: Dec. 3, 1996**

[54] **PERSONAL IDENTIFICATION**

[75] Inventor: **Walter C. Bonneau, Jr.**, Missouri City, Tex.

[73] Assignee: **Texas Instruments Incorporated**, Dallas, Tex.

[21] Appl. No.: **615,575**

[22] Filed: **Mar. 12, 1996**

**Related U.S. Application Data**

[63] Continuation of Ser. No. 472,624, Jun. 7, 1995, abandoned, which is a continuation of Ser. No. 995,653, Dec. 21, 1992, abandoned.

[51] **Int. Cl.**[6] ..... **G06K 9/00**

[52] **U.S. Cl.** ..... **382/116**; 235/380; 340/825.34

[58] **Field of Search** ..... 382/115, 116, 382/119, 124, 125, 209, 218; 340/825.34; 235/380

[56] **References Cited**

U.S. PATENT DOCUMENTS

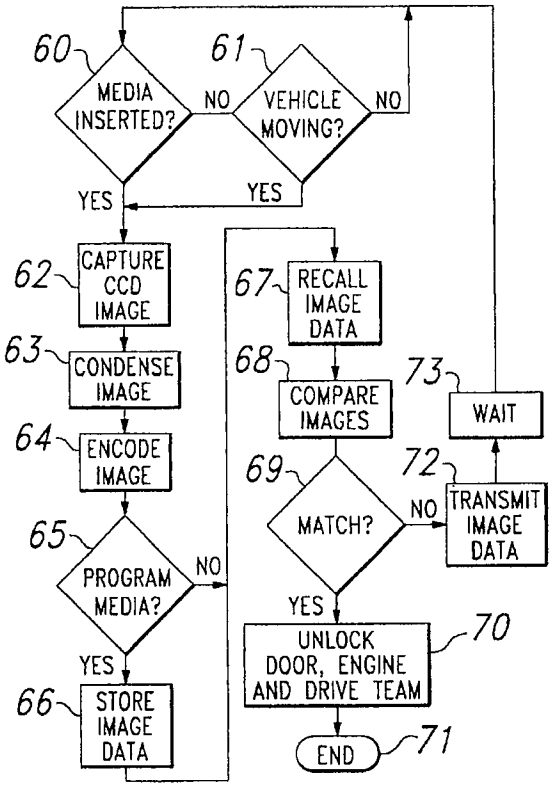
| | | | |
|---|---|---|---|
| 4,993,068 | 2/1991 | Piosenka et al. | 382/116 |
| 4,995,086 | 2/1991 | Lilley et al. | 382/124 |

*Primary Examiner*—Joseph Mancuso
*Attorney, Agent, or Firm*—Robert D. Marshall, Jr.; James C. Kesterson; Richard L. Donaldson

[57] **ABSTRACT**

A portable optical media imaging system for use in personal identification includes: a portable optical media card (**13**); an optical reader (**34**), having circuitry for reading information from the portable optical media card (**13**); an image scanner (**30**); an image system processor (**31**), including an encoder connected to the image scanner, and a comparator connected to the encoder and the optical reader; and transaction completion circuitry (**33, 35, 36**) connected to the comparator. This is also a method of personal identification verification. The method comprises: capturing a personal identification image directly from customer or operator; feeding the personal identification image into an encoder; capturing appropriate identification data from an optical media card; comparing the encoded image to the data from the optical media card; determining if the customer is true owner of the optical media credit card; and performing correct transaction. Alternatively, the method could comprise: capturing a personal identification image directly from customer or operator; capturing appropriate identification data from an optical media card; decoding the identification data from the optical media card; comparing the decoded data to the personal identification image from the customer or operator; determining if the customer is true owner of the optical media credit card; and performing correct transaction. In an alternative embodiment a microphone (**101**) and an audio system (**102**) capture voice print data for identity verification.

**44 Claims, 6 Drawing Sheets**



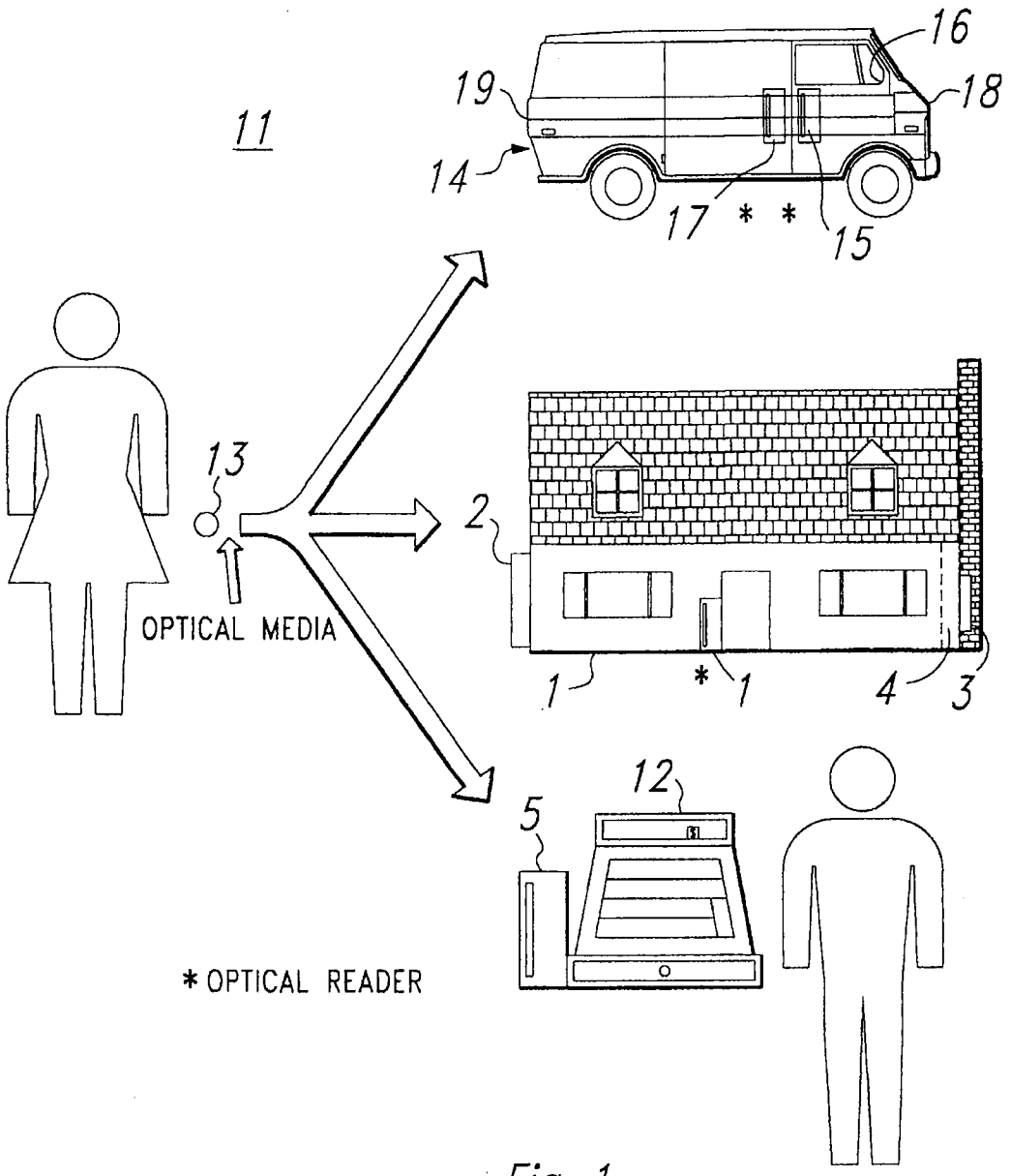



Fig. 1

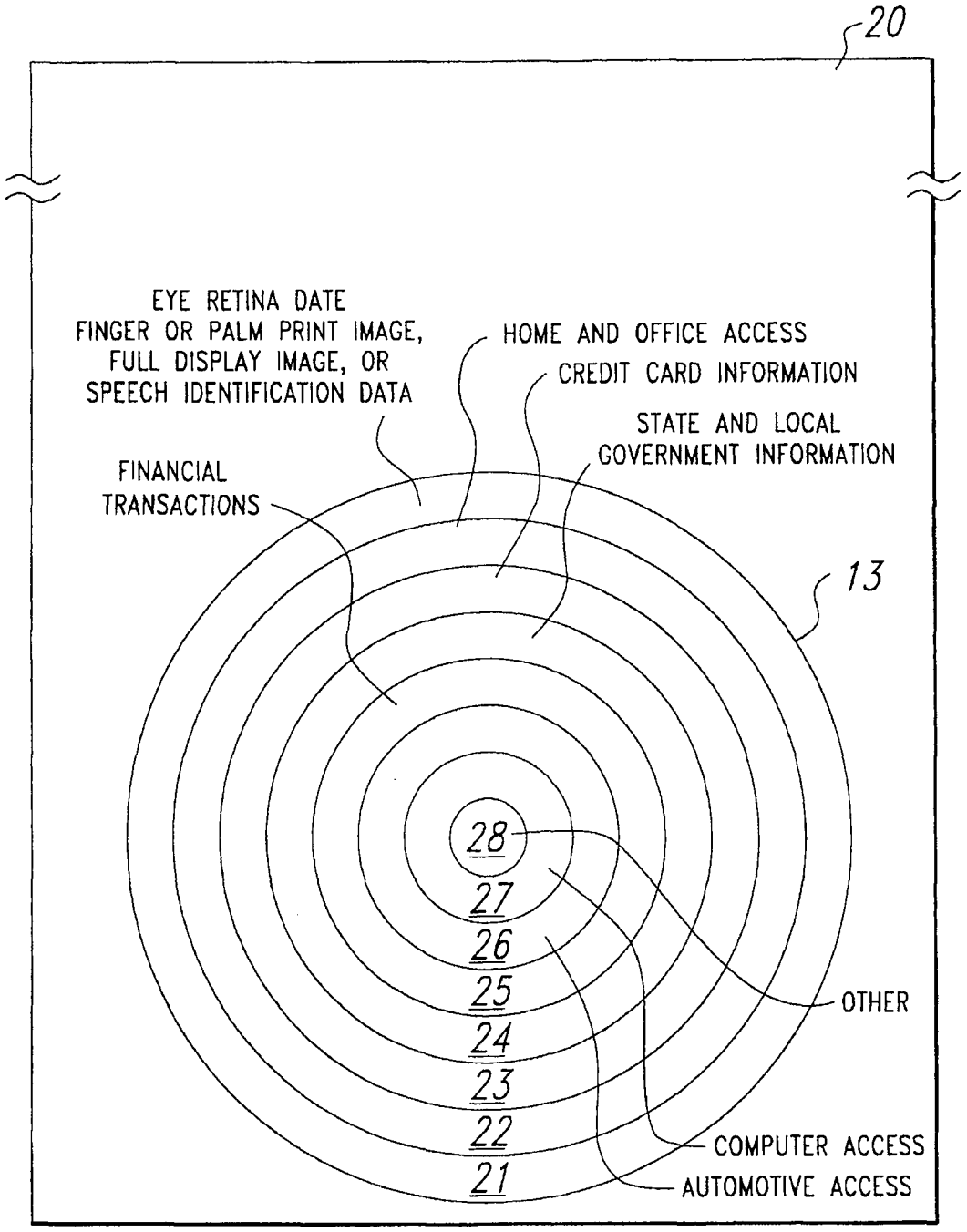

20
EYE RETINA DATE
FINGER OR PALM PRINT IMAGE,
FULL DISPLAY IMAGE, OR
SPEECH IDENTIFICATION DATA
HOME AND OFFICE ACCESS
CREDIT CARD INFORMATION
STATE AND LOCAL
GOVERNMENT INFORMATION
FINANCIAL
TRANSACTIONS
13
28
27
26
25
24
23
22
21
OTHER
COMPUTER ACCESS
AUTOMOTIVE ACCESS

Fig. 2

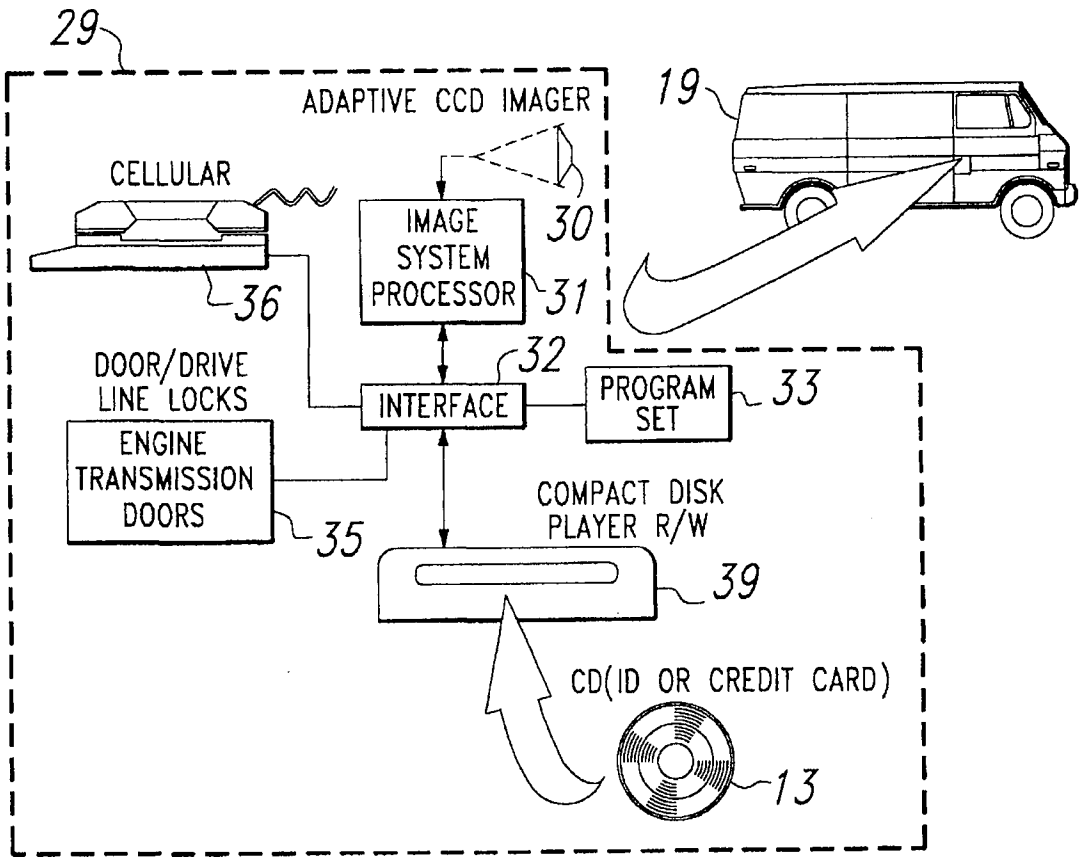

29
ADAPTIVE CCD IMAGER
19
CELLULAR
IMAGE SYSTEM PROCESSOR
30
31
36
32
DOOR/DRIVE LINE LOCKS
INTERFACE
PROGRAM SET
33
ENGINE TRANSMISSION DOORS
35
COMPACT DISK PLAYER R/W
39
CD(ID OR CREDIT CARD)
13

Fig. 3

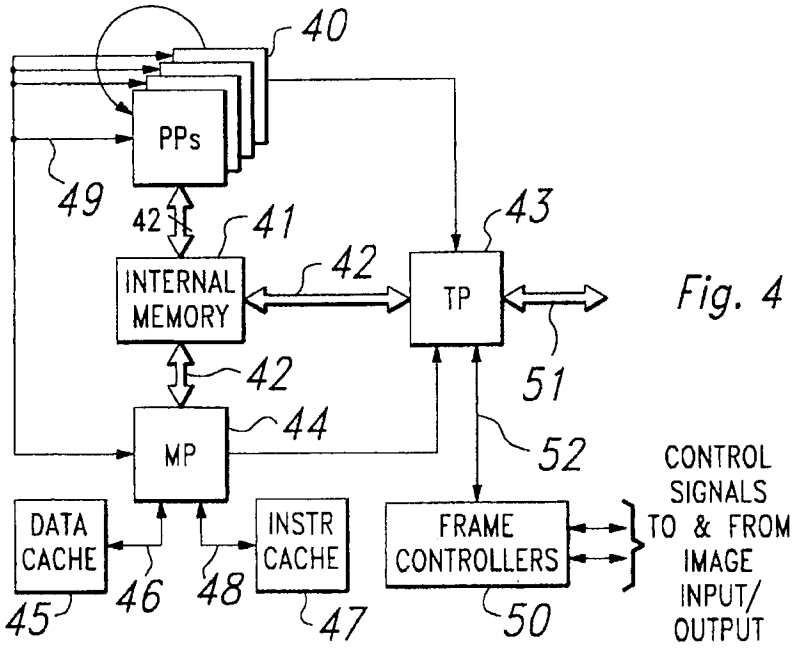

40
PPs
49
42
41
43
INTERNAL MEMORY
42
TP
51
42
44
MP
52
CONTROL SIGNALS TO & FROM IMAGE INPUT/ OUTPUT
DATA CACHE
46
48
INSTR CACHE
45
47
FRAME CONTROLLERS
50

Fig. 4

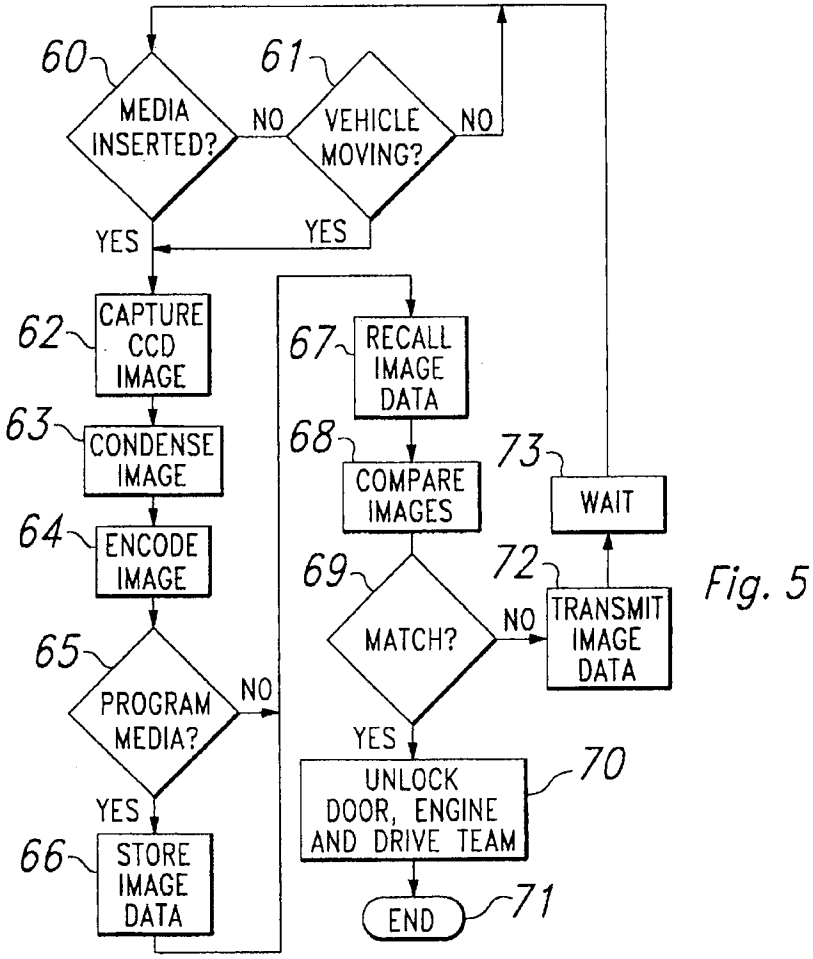

60
MEDIA INSERTED?
NO
61
VEHICLE MOVING?
NO
YES
YES
62
CAPTURE CCD IMAGE
63
CONDENSE IMAGE
64
ENCODE IMAGE
65
PROGRAM MEDIA?
NO
YES
66
STORE IMAGE DATA
67
RECALL IMAGE DATA
68
COMPARE IMAGES
69
MATCH?
NO
YES
70
UNLOCK DOOR, ENGINE AND DRIVE TEAM
71
END
72
TRANSMIT IMAGE DATA
73
WAIT

Fig. 5

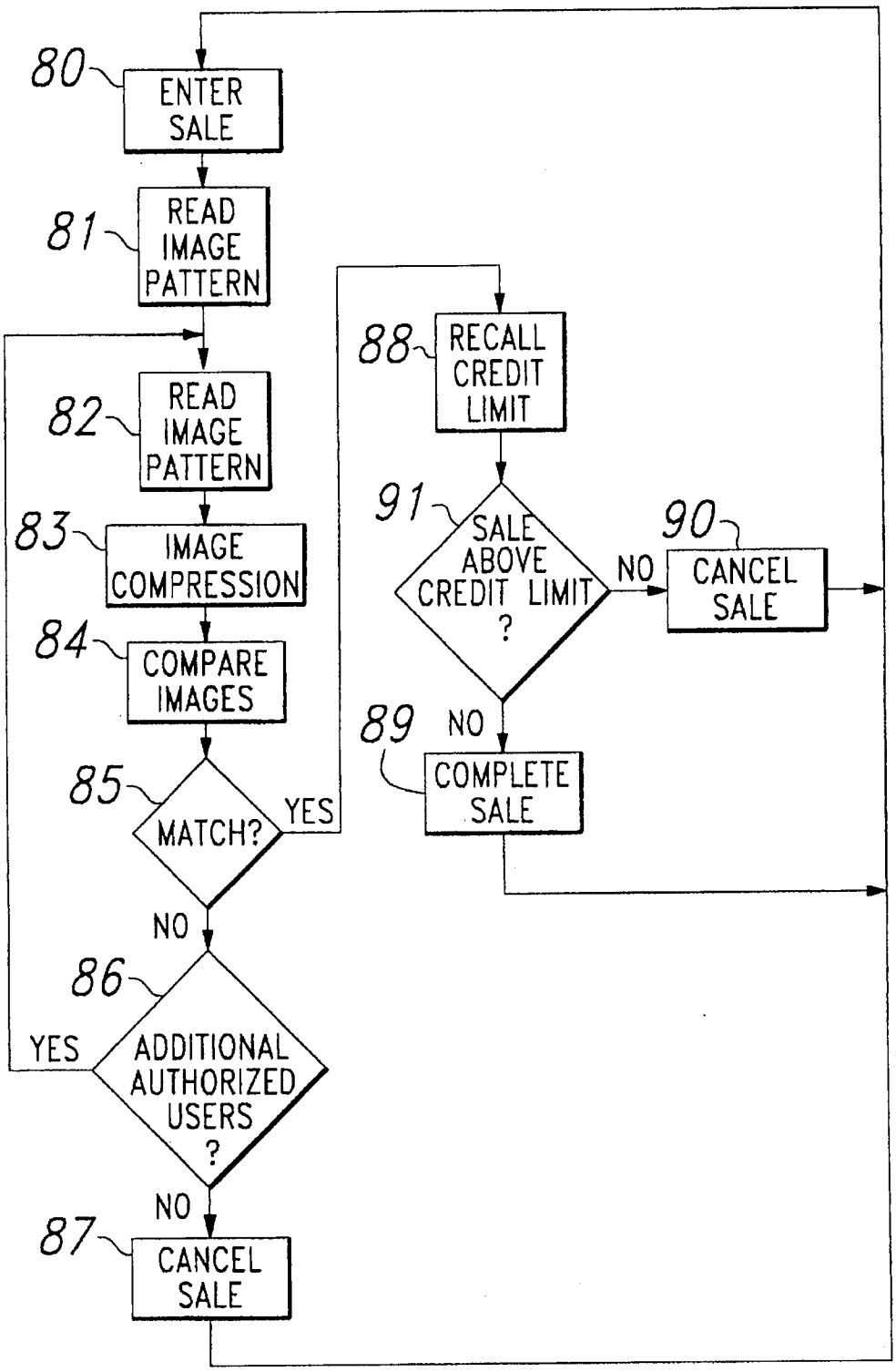

80
ENTER SALE
81
READ IMAGE PATTERN
82
READ IMAGE PATTERN
83
IMAGE COMPRESSION
84
COMPARE IMAGES
85
MATCH?
YES
NO
86
ADDITIONAL AUTHORIZED USERS ?
YES
NO
87
CANCEL SALE
88
RECALL CREDIT LIMIT
91
SALE ABOVE CREDIT LIMIT ?
NO
90
CANCEL SALE
NO
89
COMPLETE SALE

Fig. 6

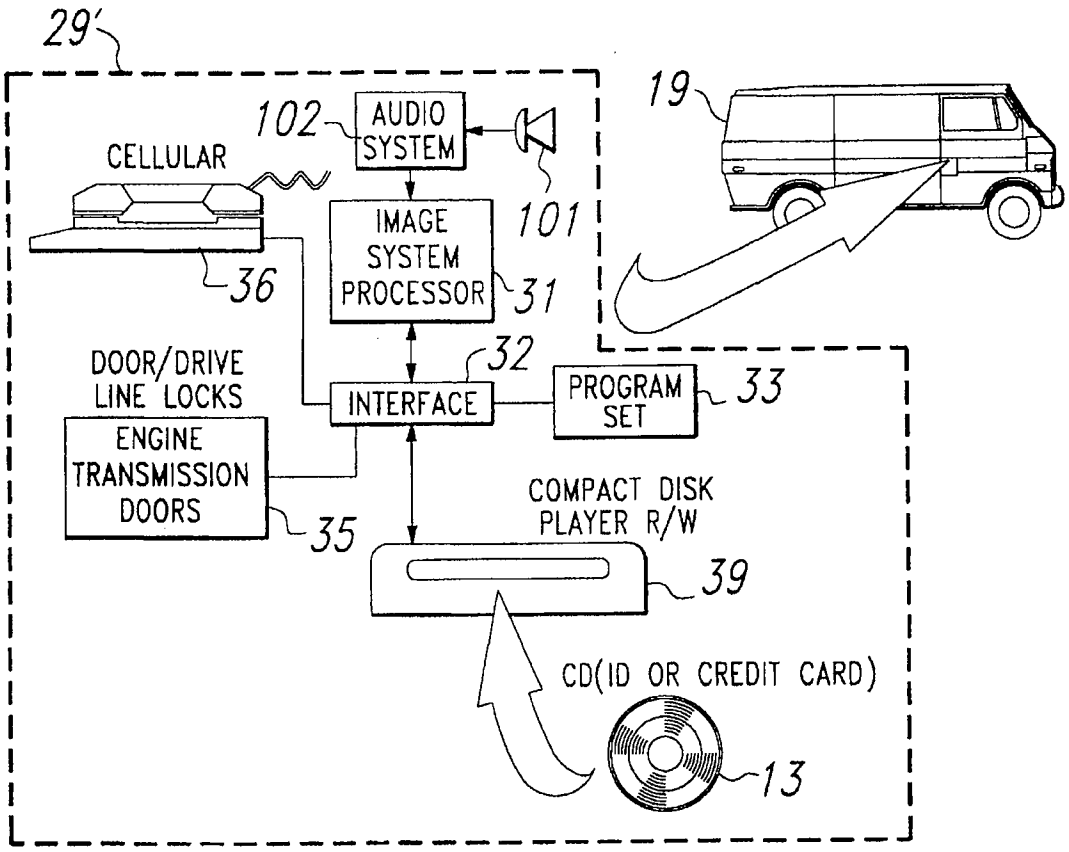

29'
19
102
AUDIO SYSTEM
CELLULAR
101
IMAGE SYSTEM PROCESSOR
31
36
32
DOOR/DRIVE LINE LOCKS
INTERFACE
PROGRAM SET
33
ENGINE TRANSMISSION DOORS
35
COMPACT DISK PLAYER R/W
39
CD(ID OR CREDIT CARD)
13

Fig. 7

# PERSONAL IDENTIFICATION

This application is a continuation of application Ser. No. 08/472,624, filed Jun. 07, 1995 now abandoned which is a continuation of application Ser. No. 07/995,653, filed Dec. 21, 1992 now abandoned.

## FIELD OF THE INVENTION

This invention generally relates to the field of identity verification.

## BACKGROUND OF THE INVENTION

Security of personal credit card ownership is a problem for banks, retailers, and lending institutions. There is a need for a way to verify that a person holding a credit card is actually the owner of the card. Such verification would help prevent unauthorized use of a credit card.

There is also a need to reduce the large data bases which must be maintained by retailers and banks in order to maintain personal data for each card holder such as billing addresses and credit limits. Additionally, a need exists to reduce the number of credit cards, identification papers (i.e. driver's license and social security card), and keys to buildings and machinery that each person must carry.

Such problems are overcome by the improvements afforded by this invention.

## SUMMARY OF THE INVENTION

A portable optical media imaging system for use in personal identification includes: a portable optical media card; an optical reader for reading information from the portable optical media card; an image scanner; an encoder connected to the image scanner; a comparator connected to the encoder and the optical reader; and a transaction completion circuit connected to the comparator. Preferably the image scanner captures data corresponding to a physical characteristic of a person, such as finger print or palm print information, eye retina pattern data, full facial image or speech identification data such as voice print data. The portable optical media card has multiple tracks for storing and retrieving selected personal data in separate directories. The system stores data within and retrieves data from the portable optical media card.

A method of personal identification verification includes; capturing a personal identification image directly from the customer or operator; feeding the personal identification image into an encoder; retrieving corresponding identification data from an optical media card; comparing the encoded image to the data from the optical media card; determining if the customer is true owner of the optical media credit card; and performing a correct transaction.

Preferably the method could include the steps of feeding the personal identification image to a scaler to reduce image size; feeding the reduced image into an encoder; storing the encoded information on the optical media card; and retrieving personal information from the optical media card such as access rights if it has been determined that the customer is the true owner of the optical media card. The personal identification data captured directly from the customer could be a finger print, palm print, eye retina pattern print, full facial image, or a voice print.

The invention advantageously provides a manner for storing personal information in the size, shape and mobility of the credit card. Since the information for many credit cards and access to various points of entry (i.e., car, home, television, telephone, etc) can be stored on one portable optical card media the need to carry many keys and credit cards or other information papers (such as a driver's license) is reduced or eliminated. The portable optical media card allows secured access to the car, home, telephone, secured areas at the work place, etc.



## BRIEF DESCRIPTION OF THE DRAWINGS

These and other aspects of this invention are illustrated in the drawings, in which:

FIG. **1** is a diagram illustrating examples of the use of a optical media image system of this invention;

FIG. **2** is a diagram of a portable optical media card;

FIG. **3** is a block diagram the preferred embodiment of the optical media image system of FIG. 1;

FIG. **4** is a block diagram of the image system processor of FIG. **3**;

FIG. **5** is a flow diagram of the preferred method of using the optical media card image system in an automobile;

FIG. **6** is a flow diagram of a further embodiment of the optical media care image system used at the point of sale in a credit transaction; and

FIG. **7** is a block diagram of an alternative embodiment of the optical media image system of FIG. 1 employing speech identification data.

## DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

In FIG. **1**, an optical media system **11**, for daily activities provides users with an optical media card **13**, personalized for use in an automobile **14**, house **10**, and at a store's point of sale **12**.

In automobile **14**, media sensors or readers may be located at any or all of the following locations: passenger door **15**, ignition activation system **16**, sliding door or loading door **17**, engine compartment hood **18**, and rear hatch or panel doors **19**. In contrast to conventional key operated entry mechanisms, the optical media card **13**, becomes the personalized key element in addition to or in substitution for familiar toothed keys. The media sensor is advantageously located analogously in cars, vans, recreation vehicles, motorcycles, light and heavy trucks, semi-trailer trucks, buses, trains, helicopters and airplanes, and boats and ships for entry to compartments and for activating engines or other machinery.

In the home **10** of FIG. **1**, media sensors are analogously located at door **1**, which is representative of front entrance, back door, patio door and other doors of swinging, sliding, multi-part, lifting and other types. Another media sensor may be provided at the garage door **2**, for unlocking it and operating an automatic garage door opener. A further media sensor may be provided at utility service compartment **3**, for any or all of electricity, water, fuel, and other utilities and provided at furnace and air conditioning compartment **4**. Still other locations for sensor location and operation are home safe, telephone, computer and television for personalized entry to functions or programming suited to different ages or persons, closets and other rooms, swimming pool entrance, swimming pool pump or machine area, entries to outbuildings and entry gates.

Analogous media sensor locations are also desirable in apartments, hotels, offices, factories and mills, airports, docks, bridges, stations, retail and wholesale commercial

establishments, and farms such as grain and truck farms, livestock farms, dairy farms, and ranches. Some applications include photocopiers, facsimile and printing equipment, pay telephones, video conferencing equipment, point of sale terminals such as registers **12**, and media sensors **5**, in FIG. **1**. In the office and factory environment, access to various areas, machines, and assembly line locations may be suitably personalized and activated according to work group, job category, and levels of clearance. In the agricultural environment, media sensors are provided for gates, barns, elevators, silos, tractors, and planting, tillage and harvesting machines, milking machines, pumps and all other areas, devices and applications to which their advantages suit them. In the energy area, oil and gas rigs and platforms, mines and power plants are analogously fitted with media sensors.

In one important mode of use, a person whose identification data is on the optical media card **13**, puts a finger on a sensor on the car door **15** while supplying optical media card **13** to be read. The current finger print data is compared with the finger print information read from optical media card **13**. When a match is detected, the person is cleared for entry. Since this mode depends on a match between the person and the identification data on optical media card **13**, the mere presence of the identification data image on optical media card **13**, will not grant access. Thus no security breach occurs if optical media card **13** is lost or stolen.

In FIG. **2** portable optical media card **13** contains information stored in multiple directories. The information on the optical media card **13** includes automobile access data **26**, credit card information **23**, financial transaction records **25**, home or office entry data **22**, computer access codes **27** and other facts and information **28**. Optical media card **13** stores finger print data, palm print data, eye retina pattern data, full facial image data or speech identification data such as voice print data on directory **21**. Portable optical media card **13** is suitably an optical CD-ROM/WORM (compact disk read only memory/write-once read memory) disk having a circular shape. In the preferred embodiment the disk has a diameter of about two inches (5.08 centimeters), however other sizes may be used. The disk can be affixed or removably included in a rectangular plastic card or otherwise carried in a convenient protective element **20**. Linear storage media such as rectangular optically read media are also feasible. Media which are read by magnetic, acoustic, electric and any other suitable means are also contemplated in various embodiments.

Due to the advantageous density of storage, the optical media card **13**, has ample space to hold information for many different areas of access, many credit cards, many forms of identification, and many documents.

FIG. **3** illustrates the preferred automotive imaging security system **29** for use with the portable optical media card **13**. This example employs automobile **14** illustrated in FIG. **1**. An image, such as a finger print, eye retina pattern or the like, is entered into the system through a camera **30**, which is preferably a charge coupled device (CCD) camera. Camera **30** supplies a captured image to image system processor **31**, such as the image system processor described below with respect to FIG. **4**. The image system processor **31** is also connected through an interface **32** to an optical reader **34**, such as a compact disk player. The optical reader **34** may read information from or write information to portable optical media card **13**, such as the compact disk (CD) described hereinabove. A telephone **36**, such as a cellular phone, may be connected to the interface **32** for sending information over telephone lines. For example, the automotive imaging security system **29** may telephone a security company or the police department if the image system processor **31** determines that the person seeking entry to the automobile is not authorized and therefore may be a car thief. This telephone communication may send data including the image data taken from the possible car thief to permit identification of the supposed thief. Automobile controls may also be connected to the interface **32**, so that the doors unlock if image system processor **31** determines that the person seeking entry is authorized and a signal could then be sent to allow activation of the automobile engine and transmission **35**. A program set **33** may also be connected to the interface **32** to facilitate the storage of information on the optical media card **13**, such as authorization of another family member to use the automobile.

In FIG. **4** an image system processor **31** performs the algorithms, encoding, decoding, and decision making necessary for the automotive imaging security system **29** of FIG. **3**. Scanning and image processing system technology is disclosed in commonly assigned U.S. Pat. application Ser. No. 933,865 filed Aug. 21, 1992 by Robert Gore et al, entitled "MULTI-PROCESSOR WITH CROSSBAR LINK OF PROCESSORS AND MEMORIES AND METHOD OF OPERATION", which is a continuation of U.S. patent application Ser. No. 435,591 filed Nov. 17, 1989 and hereby incorporated herein by reference. The image processing system **31** includes parallel processors **40** connected to internal memory **41** via crossbar switch **42**, which is shown in FIG. **4** as a distributed bus. The parallel processors **40** perform optical character recognition (OCR), encoding and decoding. The encoding and decoding preferably involves a discrete cosine transformation that takes a series of pixels representing an image and averages them and compresses the image into a relatively small number of bytes. The Joint Photographic Engineering Group (JPEG) standard compression algorithm or a similar algorithm is suitable for this application. Crossbar switch **42** also connects transfer processor **43** and master processor **44** to internal memory **41**. Master processor **44** is further connected to data cache **45** via bus **46** and to instruction cache **47** via bus **48**. Parallel processors **40** are interconnected via communication bus **49**, so that the processors can communicate with each other and with master processor **44** and with transfer processor **43**. Transfer processor **43** communicates with the optical reader **34** via bus **51**.

Also illustrated in FIG. **4**, frame controllers **50** communicate with transfer processor **43** via bus **52**. Frame controllers **50** and the master processor **44** control the optical reader **34** (FIG. **3**) and serve to control image inputs and outputs through the transfer processor **43**. These inputs can be, for example, the finger print or eye retina pattern image received through the camera **30**, and the output can be, for example, a signal to unlock the automobile doors.

FIG. **5** illustrates steps taken in the preferred embodiment of the method discussed with respect to FIG. **3**. Step **60** determines if optical reader **34** senses that an optical media card **13** has been inserted. Step **61** determines if camera **30** has detected motion of the automobile. This detected motion could result if the automobile was being stolen and driven or towed away. At step **62** an image is captured by CCD camera **30**. An image divider (step **63**) condenses the image by omitting unnecessary image data. In the case of a finger print image, this image division may include detecting curvatures and sporadic lines that are the distinguishing features of the finger print. The condensed image is then encoded according to an image compression algorithm (step **64**), such as the JPEG format or similar image compression algorithm. The

encoded image is now unrecognizable as a finger print, but more importantly the encoded image now requires less bits to describe. In an alternative embodiment the encoding step **64** is omitted and instead the sensed image data is used directly.

One option at this point is programming of the portable optical media card **13** (step **65**). The encoded data may be stored in the portable optical media card **13**. If the portable optical media card **13** is to be programmed (step **65**), then the encoded image data is stored on the portable optical media card (step **66**). This option would most probably be exercised to add another authorized user. This could occur, for example, when another family member wants to use portable optical media card **13** for access to the family automobile. To facilitate this additional access, identity data, such as the finger print data just mentioned, would be stored onto the portable optical media card **13**.

In the event that programming portable optical media card **13** is not selected, then image data is recalled from portable optical media card **13** (step **67**). The optical reader **34** optically and electronically senses and recognizes the information loaded onto the portable optical media card **13**, from each of the tracks for which it is programmed or adapted by hardware to sense. The image data recalled from optical media card **13** is already in a compressed image format, such as the JPEG format or similar image compression format, which is unrecognizable as a finger print. Next the captured image is compared with the recalled image (step **68**). Both the encoded image from the CCD camera **30** and the recalled image from portable optical media card **13** are in a compressed image format, such as the JPEG format or similar image compression format, so the images should match. A modest amount of relative displacement of the finger print in the image fields or variation in intensity and contrast does not prevent a match determination provided the images are of the same actual finger print. The critical points are compared and an algorithm computes a figure of merit or confidence in the match. If the figure of merit is sufficient in value to indicate a match (step **69**), then the transaction is completed by unlocking the door, the engine and drive train (step **70**). This completes the task of automotive imaging security system **29** (step **71**) for this entry.

As an alternative, the recalled identity data and the just acquired physical characteristic data, such as finger print image data, are compared in uncompressed form. In this alternative, the just acquired physical characteristic data is not compressed prior to comparison. Instead the image data recalled from portable optical media card **13** is decoded and decompressed in accordance with the reverse of the encoding algorithm. The two uncompressed images are then compared to determine if the degree of correspondence exceeds the predetermined amount. Depending upon the type of data and the encoding algorithm, comparison in the compressed form or in the uncompressed form may yield more reliable results.

If the images do not match in step **69**, the image captured by CCD camera **30** is transmitted through the automobile telephone **36** to a security company or the police department (step **72**). This image may be the finger print of a thief or other unauthorized user of vehicle **14**. After a wait of a certain period of time (step **73**), the automotive imaging security system **29** returns to step **60** to determine if a portable optical media card **13** is inserted into compact disk player **34**, and to step **61** to determine if there is vehicle movement.

FIG. **6** illustrates a flow diagram of another embodiment of this invention used at the point of sale of a credit transaction. The process starts by entering the sale (step **80**) into the point of sale system. This entry could be by manually keying in data describing the goods and/or the price or by reading a bar code attached to the goods. The customer then looks into an imager for the eye retina pattern or places a finger on a scanner for a finger print scan (step **81**). Next, the optical card media **13** is read to recall the image data (step **82**). In accordance with this embodiment, optical card media **13** stores the customer's eye retina pattern data or finger print data in a compressed image format, such as the JPEG format or similar image compression format. This data is decoded (step **84**) and compared with the just obtained image of the customer's eye retina pattern or finger print pattern (step **84**).

In the event that the comparison fails to meet the required degree of correspondence (step **85**), then the point of sale apparatus determines if optical media card **13** includes image data for another authorized customer (step **86**). If there are additional authorized users, control returns to step **82** to recall the additional image. This is decoded (step **83**) and compared with the recently taken image (step **84**) as previously described. The process remains in this loop until either the match criteria is satisfied (step **85**) or no further image data is stored on optical media card **13** (step **86**). If no match is found for any authorized user, then the use is unauthorized and the sale cancelled (step **87**). Thereafter control returns to step **80** for the next sale.

Upon determination that the customer is an authorized user of optical media card **13**, the credit limit of that authorized user is recalled from optical media card **13** (step **88**). In the case of plural authorized users, there may be a different credit limit for each user. The recalled credit limit corresponds to the authorized user whose recalled eye retina pattern data or finger print data satisfied the match criteria with the just scanned eye retina pattern or finger print. Next the sales total is compared to the credit limit (step **89**). If the proposed sale is above the credit limit, the sale is cancelled (step **90**). Though this customer is authorized to use this optical media card **13**, this attempted purchase violates the customer's credit limit. If the proposed sale is not above the recalled credit limit, then the sale is competed (step **91**). In either event control returns to step **80** to enter the next sale.

FIG. **7** illustrates an alternative embodiment of the automotive imaging security system **29** for use with the portable optical media card **13** illustrated in FIG. **3**. This alternative embodiment is automotive voice print identification security system **29**. The user inserts the portable optical media card **13** in the same manner as described in conjunction with FIG. **3**. The personal characteristic used for identification is the user's voice print. The user speaks into microphone **101**. Microphone **101** drives an audio system **102**. Image system processor **31**, such as illustrated in FIG. **4**, condenses and encodes the input audio data in accordance with a voice print algorithm. Other parts of the automotive voice print identification security system **29** of FIG. **7** are the same as previously illustrated in FIG. **3**.

The automotive voice print identification security system **29** illustrated in FIG. **7** is used in a manner similar to the use of the automotive imaging security system **29** illustrated in FIG. **3**. The operation occurs substantially as illustrated in the flow chart of FIG. **5**. At step **62** the apparatus captures the speech of the user via microphone **101**, audio system **102**. The speech data thus captured is then condensed (step **63**) by elimination of unnecessary data for the voice print. The voice print is formed and encoded in step **64** using image system processor **31**. Note that the architecture of image system processor **31** illustrated in FIG. **4** would

enable formation of compressed voice prints in a manner similar to formation of compressed eye retina or finger print data. Step **67** involves recall of a stored exemplar of the user's voice print in a manner similar to that previously described. Note that the storage of image data of step **66** would involve, in this alternative embodiment, storage of compressed voice print data. In other respects this alternative embodiment operates as previously described in conjunction with FIGS. **3** and **5**. One skilled in the art would also realize that with similar substitutions, voice print data could be used with the point of sale procedure illustrated in FIG. **6**.

A few preferred embodiments have been described in detail hereinabove. It is to be understood that the scope of the invention also comprehends embodiments different from those described, yet within the scope of the claims.

For example, an authorized person other than the nominal card owner can use the optical media card **13**, successfully if the authorized person has their own identifying data on the card in addition to the identifying data of the nominal card owner. This feature was alluded to in step **66** of FIG. **5**. Thus, any member of the family can enter their home on the same card if they register different finger print images in the system. Employees of the same company can enter various areas depending on merely being an employee, or can only enter restricted areas depending on their work group and clearance information. In the credit field, different credit limits for different members of a family can additionally be encoded into the optical media card **13**. Different credit card companies can have different proprietary encoding schemes for data entry on the card for security. The use of the single portable optical media card **13** obviates any need for numerous identification cards and credit cards. Suppose a person has a driver's license and wants to apply for a credit card. The driver's license information is on one track and the credit card is put on another track of the same card. Several copies of the card can be made because each one is valueless without a person in possession of the card having a physical characteristic which matches the identification data recorded on the card.

The information on the optical media card can be encrypted thereby securing the information stored on the media. Even if the media was lost it is useless without the owner accompanying it. Thus reducing the occurrence of credit card fraud. The large data bases currently maintained at retailers and banks are reduced because each person carries their information with them in the portable optical card media.

While this invention has been described with reference to illustrative embodiments, this description is not intended to be construed in a limiting sense. Various modifications and combinations of the illustrative embodiments, as well as other embodiments of the invention, will be apparent to persons skilled in the art upon reference to the description. It is therefore intended that the appended claims encompass any such modifications or embodiments.

What is claimed is:

**1**. A portable personal identification system comprising:

a portable optical media card having a first physical data track having identification data corresponding to a physical characteristic of an authorized person stored therein and at least one second physical data track having selected personal data stored therein, said portable optical media card further storing additional identification data corresponding to physical characteristic of at least one additional authorized person and additional personal data corresponding to each at least one additional authorized person;

an optical reader for reading said identification data from said first physical data track of said portable optical media card and said selected personal data from a selected one of said at least one second physical data track of said portable optical media card;

an input device for capturing physical characteristic data corresponding to a physical characteristic of a person;

a comparator connected to said optical reader and said input device for determining a degree of correspondence between said identification data for said authorized person and for each additional authorized person and said physical characteristic data; and

a transaction completion circuit connected to said comparator and said optical reader for permitting a transaction corresponding to said selected personal data read from said portable optical media card by said optical reader if said degree of correspondence between said identification data and said physical characteristic data for said authorized person or for any additional authorized person meets a predetermined match criteria, said transaction permitted corresponding to said selected personal data read from said portable optical media card corresponding to said authorized person or said additional authorized persons whose degree of correspondence between said identification data and said physical characteristic data meets said predetermined match criteria.

**2**. The portable personal identification system of claim **1**, wherein:

said portable optical media card is circular and said first physical data track is disposed on the periphery of said portable optical media card.

**3**. The portable personal identification system of claim **2**, wherein:

said at least one second physical data track are disposed concentricly on said portable optical media card.

**4**. The portable personal identification system of claim **1**, wherein:

said identification data stored in said portable optical card media corresponds to a finger print of a person; and

said input device includes an image scanner for capturing image data corresponding to a finger print of a person.

**5**. The portable personal identification system of claim **1**, wherein:

said identification data stored in said portable optical card media corresponds to a palm print of a person; and

said input device includes an image scanner for capturing image data corresponding to a finger print of a person.

**6**. The portable personal identification system of claim **1**, wherein:

said identification data stored in said portable optical card media corresponds to an eye retinal pattern of a person; and

said input device includes an image scanner for capturing image data corresponding to an eye retinal pattern of a person.

**7**. The portable personal identification system of claim **1**, wherein:

said identification data stored in said portable optical card media corresponds to a full facial image of a person; and

said input device includes an image scanner for capturing image data corresponding to a full facial image of a person.

8. The portable personal identification system of claim 1, wherein:

said identification data stored in said portable optical card media corresponds to a voice print of the speech of a person; and

said input device includes a microphone and an audio system for capturing voice print data corresponding to the speech of a person.

9. The portable personal identification system of claim 1, wherein:

said transaction of said transaction completion circuit is access to a controlled space.

10. The portable personal identification system of claim 1, wherein:

said transaction of said transaction completion circuit is access to a controlled machine.

11. The portable personal identification system of claim 1, wherein:

said transaction of said transaction completion circuit is entry into a controlled process.

12. The portable personal identification system of claim 1, wherein:

said transaction of said transaction completion circuit is granting of credit.

13. The portable personal identification system of claim 12, wherein:

said transaction completion circuit permits granting of credit to the authorized person in an amount corresponding to said personal data of said authorized person if said degree of correspondence exceeds said predetermined amount.

14. A personal identification system comprising:

portable optical media card having compressed data format identification data corresponding to a physical characteristic of a plurality of authorized persons and selected personal data for each authorized person stored therein;

an optical reader for reading said identification data and said personal data from said portable optical media card;

an input device for capturing physical characteristic data corresponding to a physical characteristic of a person;

an encoder connected to said input device for encoding said physical characteristic data in said compressed data format thereby forming compressed format physical characteristic data;

a comparator connected to said input device and said optical reader for determining a degree of correspondence between said compressed format identification data for each authorized person read by said optical reader and said compressed format physical characteristic data; and

a transaction completion circuit connected to said comparator for permitting a transaction if said degree of correspondence between said compressed format identification data for each authorized person and said compressed format physical characteristic data meets a predetermined match criteria, said transaction permitted corresponding to said selected personal data read from said portable optical media card corresponding to said authorized person or said additional authorized persons whose degree of correspondence between said identification data and said physical characteristic data meets said predetermined match criteria.

15. The personal identification system of claim 14, wherein:

said input device includes an image scanner for capturing image data corresponding to a finger print of a person.

16. The personal identification system of claim 14, wherein:

said input device includes an image scanner for capturing image data corresponding to palm print of a person.

17. The personal identification system of claim 14, wherein:

said input device includes an image scanner for capturing image data corresponding to an eye retinal pattern of a person.

18. The personal identification system of claim 14, wherein:

said input device includes an image scanner for capturing image data corresponding to a full facial image of a person.

19. The personal identification system of claim 14, wherein:

said input device includes a microphone and an audio system for capturing physical characteristic data corresponding to a voice print of the speech of a person.

20. The personal identification system of claim 14, wherein:

said transaction completion circuit is further connected to said optical reader for permitting a selected one of a plurality of transactions based upon personal data of an authorized person read by said optical reader if said degree of correspondence exceeds said predetermined amount.

21. The portable personal identification system of claim 14, wherein:

said transaction of said transaction completion circuit is access to a controlled space.

22. The portable personal identification system of claim 14, wherein:

said transaction of said transaction completion circuit is access to a controlled machine.

23. The portable personal identification system of claim 14, wherein:

said transaction of said transaction completion circuit is entry into a controlled process.

24. The portable personal identification system of claim 14, wherein:

said transaction of said transaction completion circuit is granting of credit.

25. The portable personal identification system of claim 24, wherein:

said transaction completion circuit permits granting of credit to an authorized person in an amount corresponding to said corresponding personal data for that authorized person read by said optical reader if said degree of correspondence exceeds said predetermined amount.

26. A portable personal identification system comprising:

a portable optical media card having identification data corresponding to a physical characteristic of a plurality of authorized persons and corresponding personal data stored therein, said identification data being encoded in a reversible compressed data format;

an optical reader for reading said identification data and said personal data from said portable optical media card;

a decoder connected to said optical reader for decoding identification data recalled from said portable optical media card from the reversible compressed data format thereby forming decoded uncompressed identification data;

an input device for capturing physical characteristic data corresponding to a physical characteristic of a person;

a comparator connected to said optical reader and said decoder for determining a degree of correspondence between said decoded uncompressed identification data for each authorized person and said physical characteristic data; and

a transaction completion circuit connected to said comparator for permitting a transaction if said degree of correspondence between said compressed format identification data for each authorized person and said compressed format physical characteristic data meets a predetermined match criteria, said transaction permitted corresponding to said selected personal data read from said portable optical media card corresponding to said authorized person or said additional authorized persons whose degree of correspondence between said identification data and said physical characteristic data meets said predetermined match criteria.

**27**. The personal identification system of claim **26**, wherein:

said input device includes an image scanner for capturing image data corresponding to a finger print of a person.

**28**. The personal identification system of claim **26**, wherein:

said input device includes an image scanner for capturing image data corresponding to palm print of a person.

**29**. The personal identification system of claim **26**, wherein:

said input device includes an image scanner for capturing image data corresponding to an eye retinal pattern of a person.

**30**. The personal identification system of claim **26**, wherein:

said input device includes an image scanner for capturing image data corresponding to a full facial image of a person.

**31**. The personal identification system of claim **26**, wherein:

said input device includes a microphone and an audio system for capturing physical characteristic data corresponding to a voice print of the speech of a person.

**32**. The personal identification system of claim **26**, wherein:

said portable optical media card further stores selected personal data;

said optical reader further reads said personal data from said portable optical media card; and

said transaction completion circuit is further connected to said optical reader for permitting a selected one of a plurality of transactions based upon personal data read by said optical data if said degree of correspondence exceeds said predetermined amount.

**33**. The portable personal identification system of claim **26**, wherein:

said transaction of said transaction completion circuit is access to a controlled space.

**34**. The portable personal identification system of claim **26**, wherein:

said transaction of said transaction completion circuit is access to a controlled machine.

**35**. The portable personal identification system of claim **26**, wherein:

said transaction of said transaction completion circuit is entry into a controlled process.

**36**. The portable personal identification system of claim **26**, wherein:

said transaction of said transaction completion circuit is granting of credit.

**37**. The portable personal identification system of claim **36**, wherein:

said portable optical media card further stores additional compressed format identification data corresponding to a physical characteristic of at least one additional authorized person and personal data corresponding to said authorized person and personal data corresponding to each of said at least one additional authorized person;

said optical reader further reads said additional compressed format identification data and said personal data from said portable optical media card;

said comparator further determines said degree of correspondence between data for plural authorized persons read by said optical reader; and

said transaction completion circuit permits granting of credit to an authorized person in an amount corresponding to said corresponding personal data for that authorized person read by said optical reader if said degree of correspondence exceeds said predetermined amount.

**38**. A portable personal identification system comprising:

a portable optical media card having identification data corresponding to a physical characteristic of an authorized person stored therein;

an optical reader for reading data from said portable optical media card;

an input device for capturing physical characteristic data corresponding to a physical characteristic of a person;

a comparator connected to said optical reader and said input device for determining a degree of correspondence between said identification data and said physical characteristic data;

a transaction completion circuit connected to said comparator for permitting a transaction if and only if said degree of correspondence meets a predetermined match criteria; and

a transmission system for transmitting predetermined data if and only if said degree of correspondence fails to meet said predetermined match criteria.

**39**. The portable personal identification system of claim **38**, wherein:

said predetermined data transmitted by said transmission system includes said physical characteristic data.

**40**. The portable personal identification system of claim **38**, wherein:

said transmission system includes a cellular phone.

**41**. A portable personal identification system disposed in a vehicle comprising;

a portable optical media card having identification data corresponding to a physical characteristic of an authorized person stored therein;

an optical reader for detecting insertion of said portable optical media card and reading data from said portable optical media card;

an input device for capturing physical characteristic data corresponding to a physical characteristic of a person;

a motion detector for detecting if the vehicle is in motion;

a comparator connected to said optical reader and said input device for determining a degree of correspondence between said identification data and said physical characteristic data;

a transaction completion circuit connected to said comparator for permitting a operation of the vehicle if said degree of correspondence meets a predetermined match criteria; and

a transmission system for transmitting predetermined data if said degree of correspondence fails to meet said predetermined match criteria or if said optical reader fails to detect insertion of said portable optical media card and said motion detector detects motion of the vehicle.

**42**. The portable personal identification system of claim **41**, wherein:

said predetermined data transmitted by said transmission system includes said physical characteristic data.

**43**. The portable personal identification system of claim **41**, wherein:

said transmission system includes a cellular phone.

**44**. The portable personal identification system of claim **41**, wherein:

said input device and said motion detector include a single CCD camera.

* * * * *

US005959577A

# United States Patent [19]

Fan et al.

[11] Patent Number: 5,959,577

[45] Date of Patent: Sep. 28, 1999

[54] **METHOD AND STRUCTURE FOR DISTRIBUTION OF TRAVEL INFORMATION USING NETWORK**

[75] Inventors: **Rodric C. Fan**, Fremont; **Amin A. Mufti**, Kensington, both of Calif.

[73] Assignee: **Vectorlink, Inc.**, Fremont, Calif.

[21] Appl. No.: **08/924,042**

[22] Filed: **Aug. 28, 1997**

[51] **Int. Cl.**[6] ..... **G01S 5/02**

[52] **U.S. Cl.** ..... **342/357.13**; 701/208

[58] **Field of Search** ..... 342/357, 357.13; 701/208, 213

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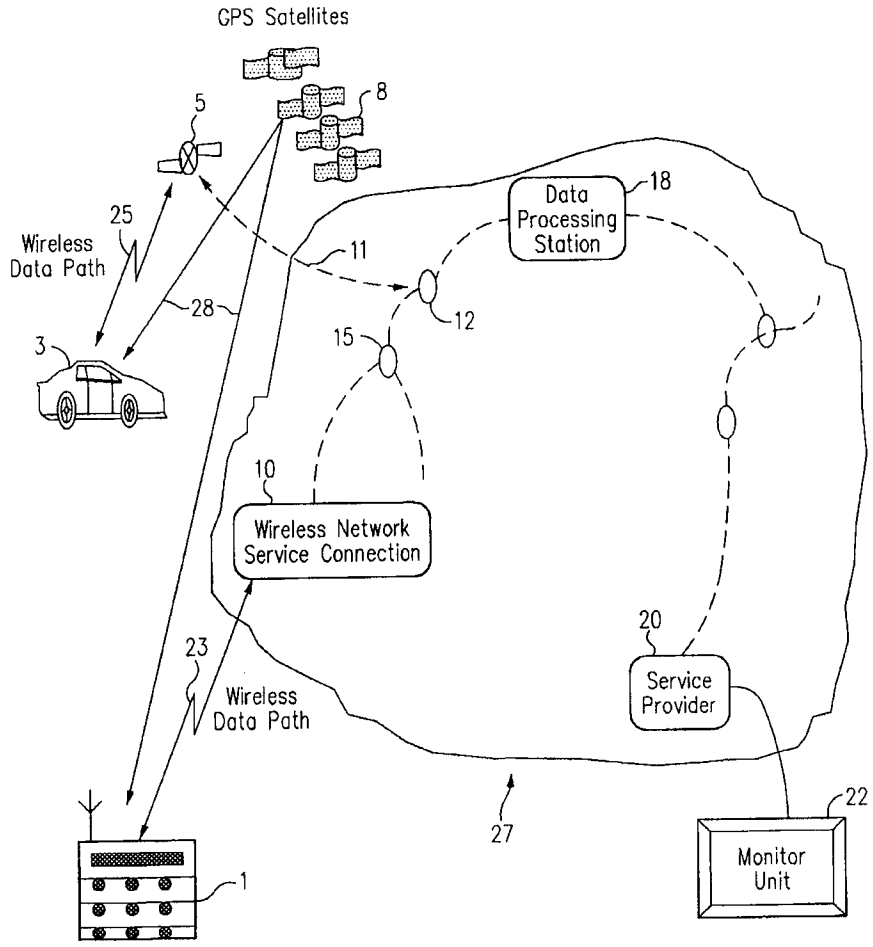
*Primary Examiner*—Mark Hellner

*Attorney, Agent, or Firm*—Skjerven, Morrill, MacPherson, Franklin, Friel LLP; Edward C. Kwok

[57] **ABSTRACT**

A method is provided for processing position and travel related information through a data processing station on a data network. In one embodiment, a GPS receiver is used to obtain a measured position fix of a mobile unit. The measured position fix is reported to the data processing station which associates the reported position to a map of the area. Typically, the measured position of the mobile unit is marked and identified by a marker on the map. The area map is then stored in the data processing station and made available for access by authorized monitor units or mobile units. An authorized monitor unit may request for a specific area map by sending a request through the data network. Upon receiving a request, the data processing unit sends the area map to the monitor unit. Data processing station may also perform a database search for travel-related information, such as directions to a gasoline station.

**44 Claims, 8 Drawing Sheets**



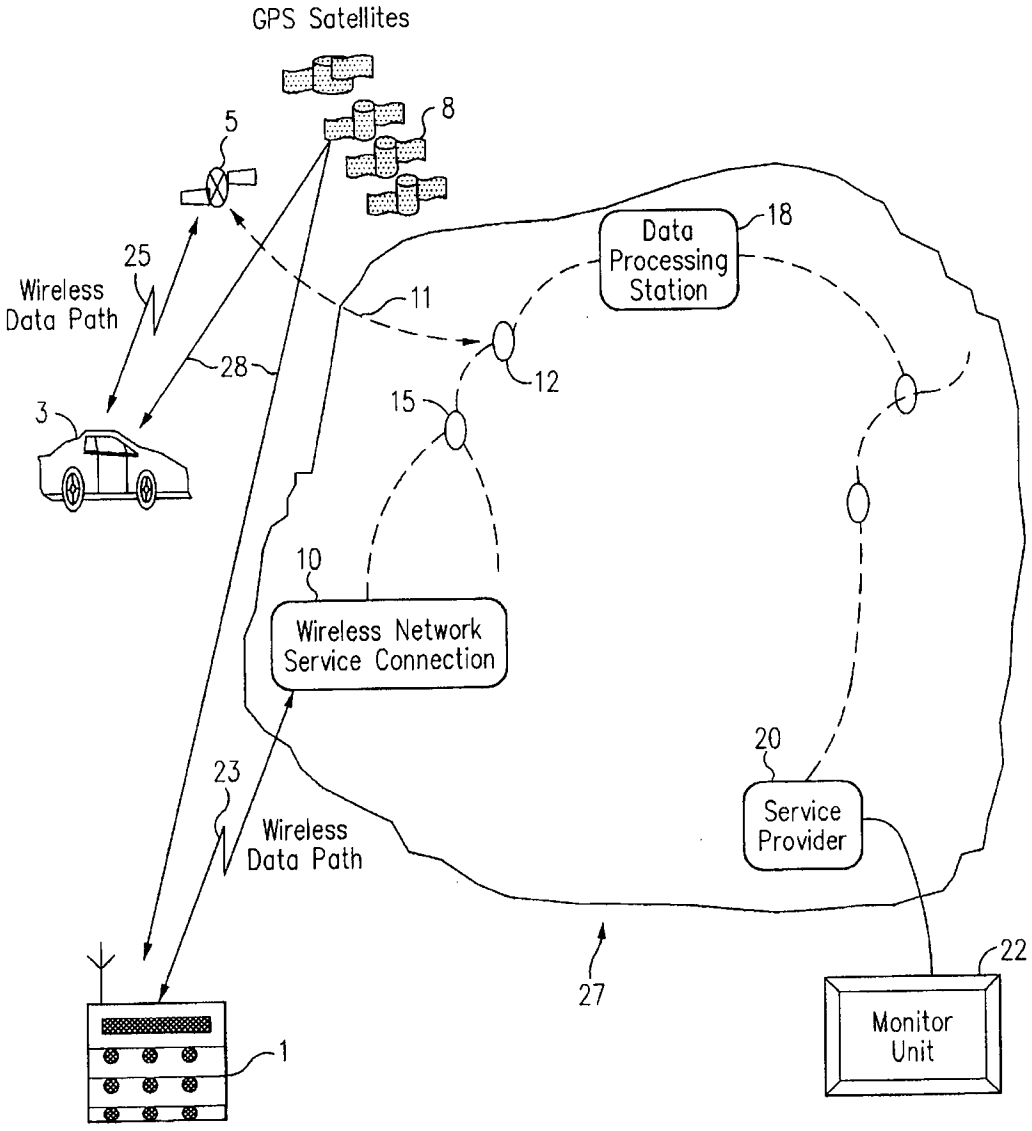

GPS Satellites
8
5
25
Wireless
Data Path
11
28
3
18
Data
Processing
Station
12
15
10
Wireless Network
Service Connection
20
23
Wireless
Data Path
Service
Provider
27
22
Monitor
Unit
1

FIG. 1

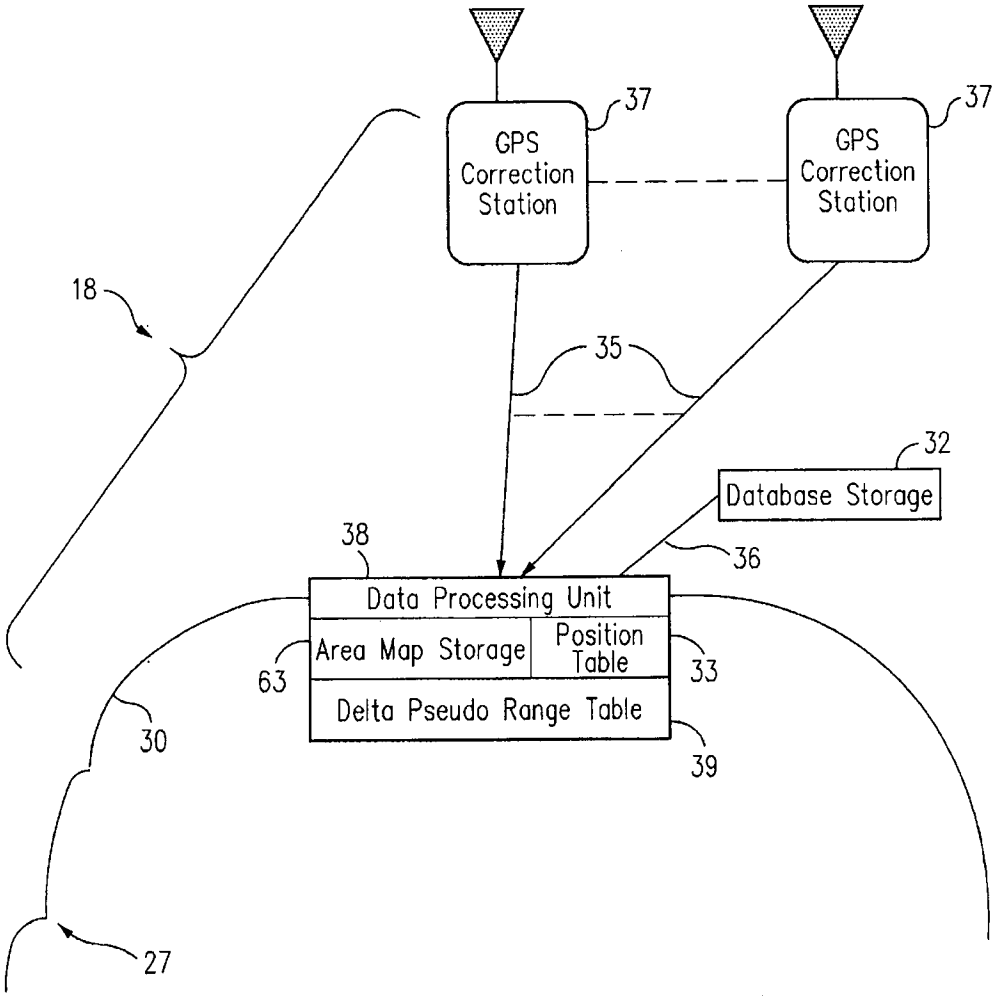

GPS Correction Station
37
GPS Correction Station
37
18
35
32
Database Storage
38
36
Data Processing Unit
Area Map Storage
Position Table
63
33
Delta Pseudo Range Table
39
30
27

FIG. 2

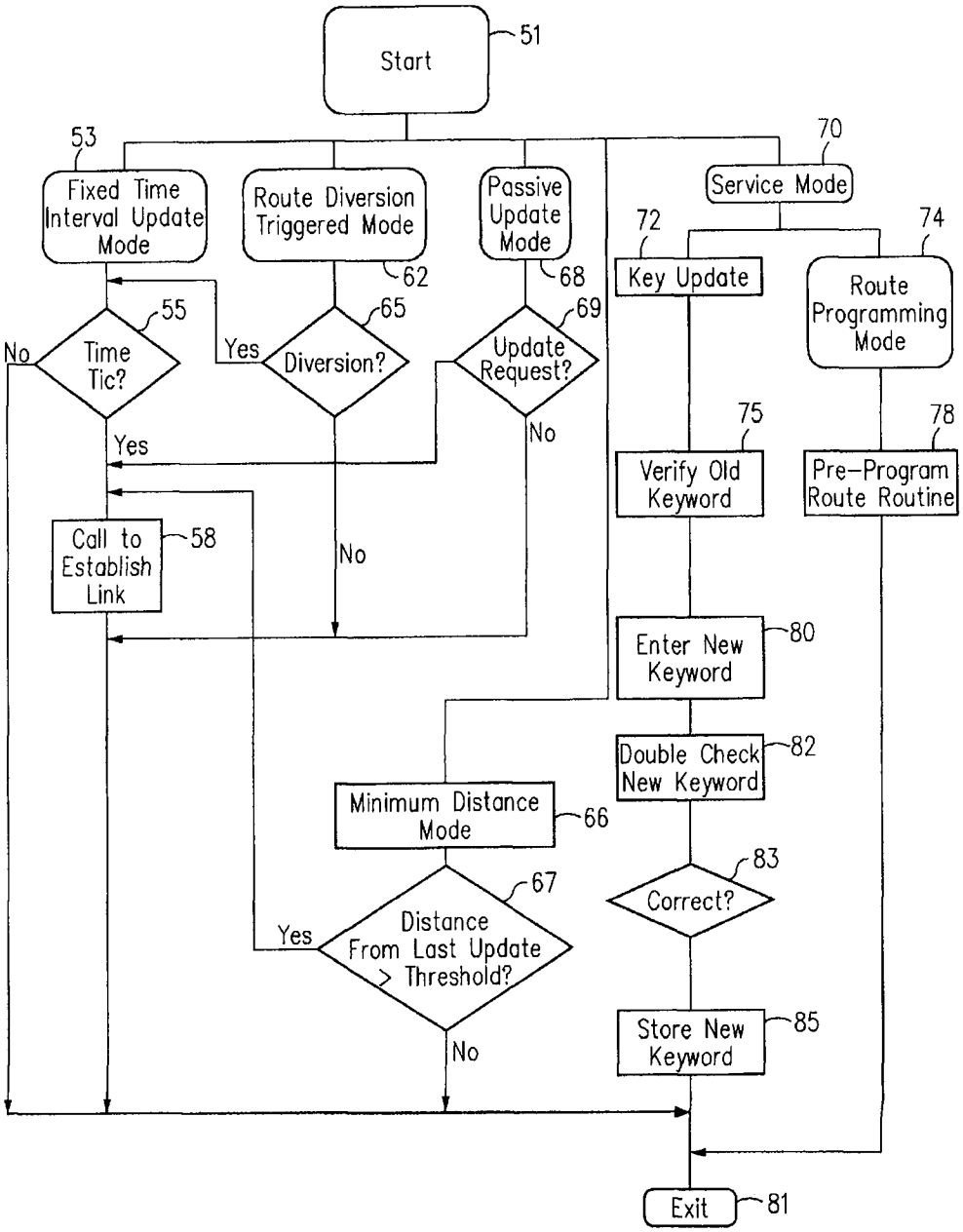

Start
51
53
Fixed Time Interval Update Mode
Route Diversion Triggered Mode
62
Passive Update Mode
68
70
Service Mode
72
Key Update
74
Route Programming Mode
55
Time Tic?
No
Yes
65
Diversion?
69
Update Request?
No
Yes
75
Verify Old Keyword
78
Pre-Program Route Routine
Call to Establish Link
58
No
Enter New Keyword
80
Double Check New Keyword
82
Minimum Distance Mode
66
83
Correct?
67
Distance From Last Update > Threshold?
Yes
No
Store New Keyword
85
Exit
81

FIG. 3

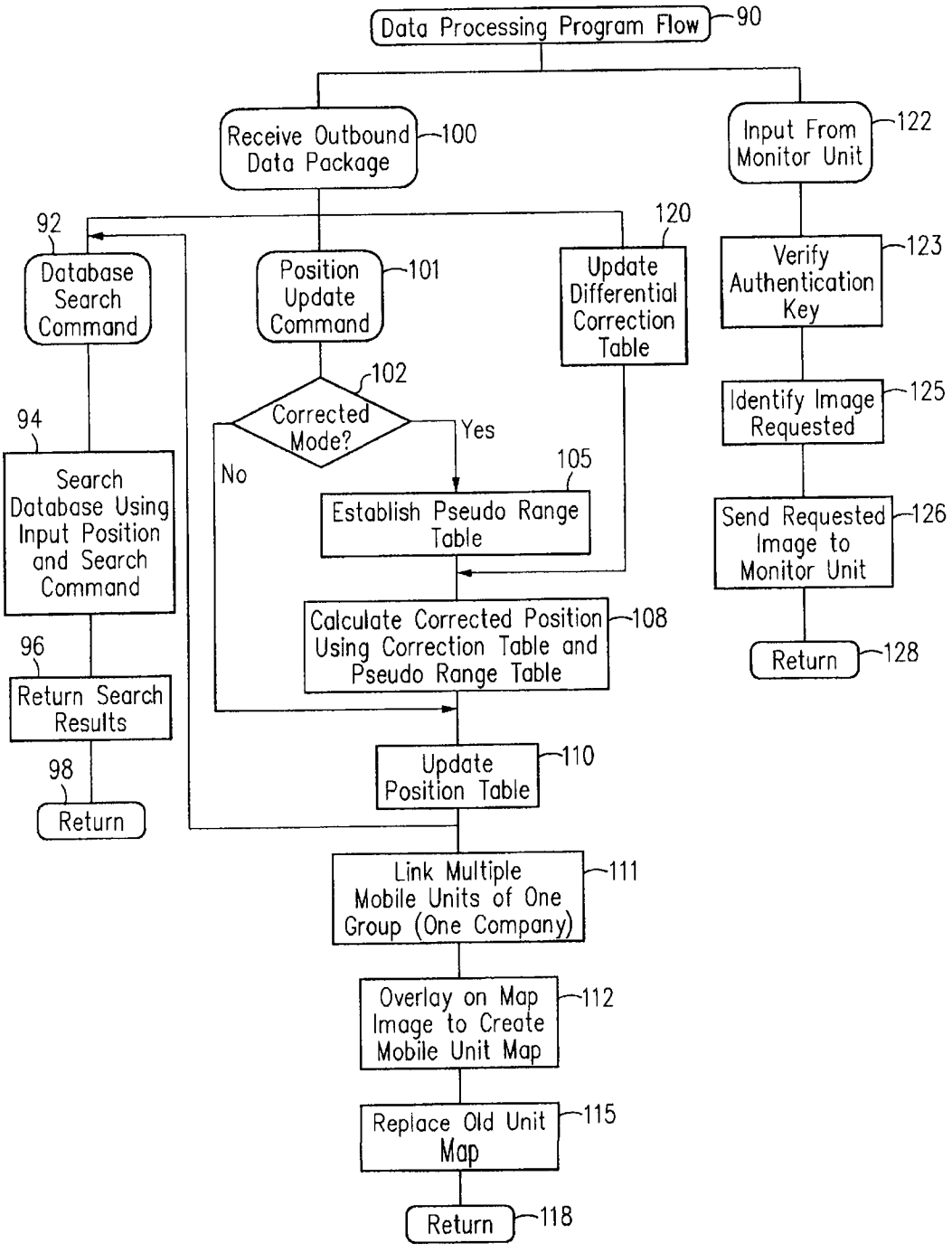

Data Processing Program Flow
90
Receive Outbound Data Package
100
Input From Monitor Unit
122
92
Database Search Command
Position Update Command
101
120
Update Differential Correction Table
Verify Authentication Key
123
102
Corrected Mode?
Yes
No
Identify Image Requested
125
94
Search Database Using Input Position and Search Command
105
Establish Pseudo Range Table
Send Requested Image to Monitor Unit
126
Calculate Corrected Position Using Correction Table and Pseudo Range Table
108
96
Return Search Results
Return
128
98
Return
Update Position Table
110
Link Multiple Mobile Units of One Group (One Company)
111
Overlay on Map Image to Create Mobile Unit Map
112
Replace Old Unit Map
115
Return
118

FIG. 4

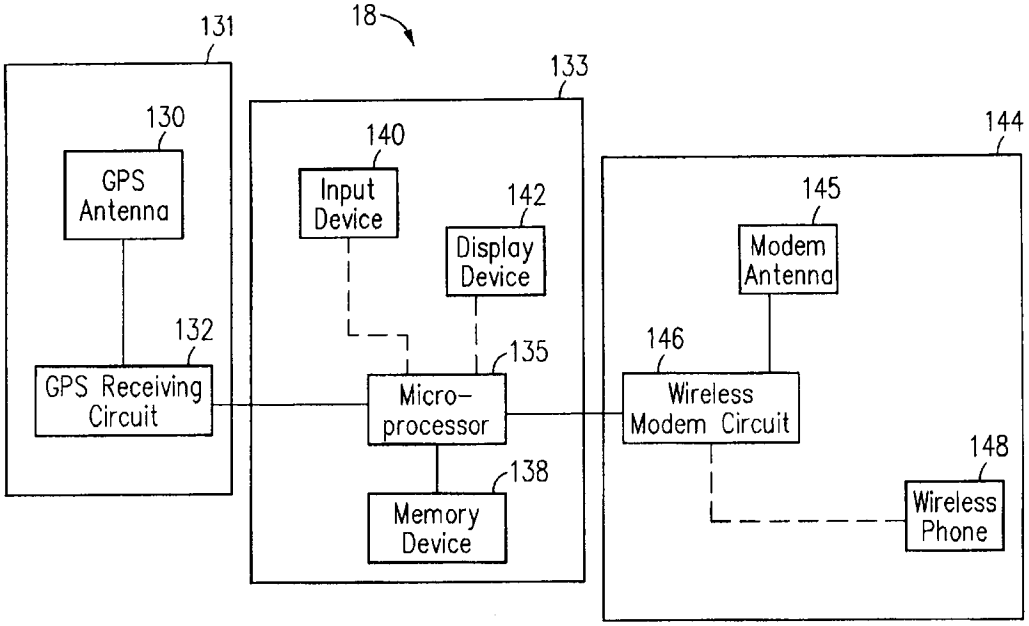

18
131
133
144
130
GPS Antenna
140
Input Device
142
Display Device
145
Modem Antenna
132
GPS Receiving Circuit
135
Micro-processor
146
Wireless Modem Circuit
148
138
Memory Device
Wireless Phone

FIG. 5

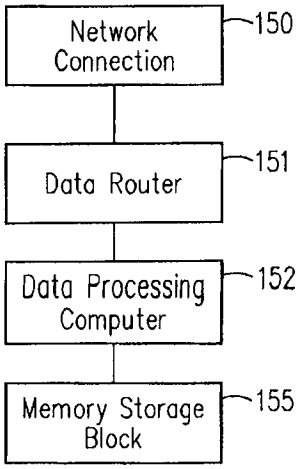

Network Connection
150
Data Router
151
Data Processing Computer
152
Memory Storage Block
155

FIG. 6

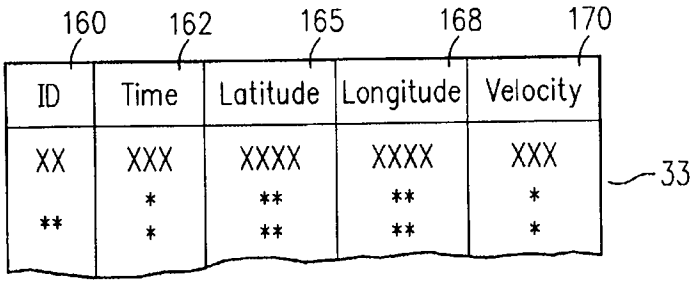



FIG. 7

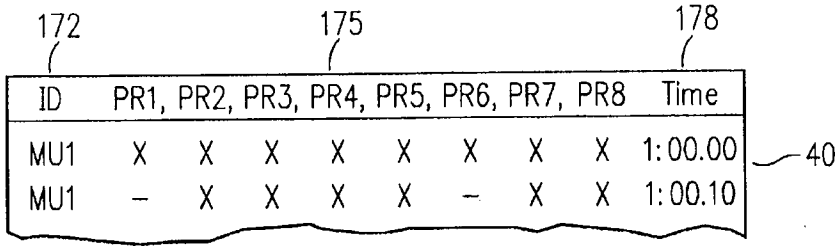



FIG. 8

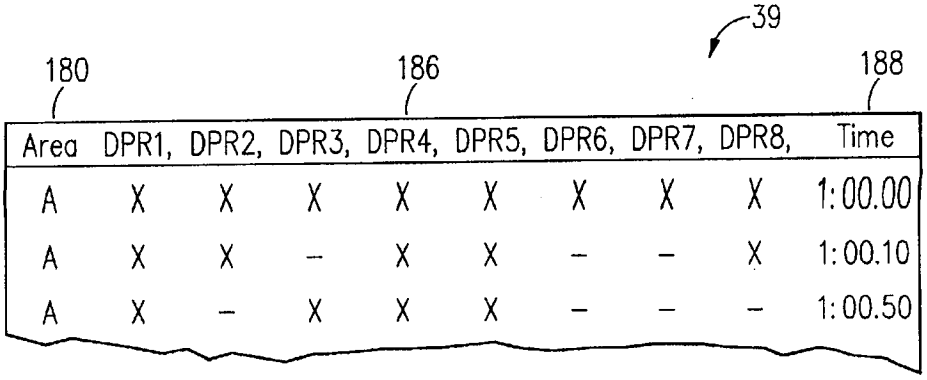



FIG. 9

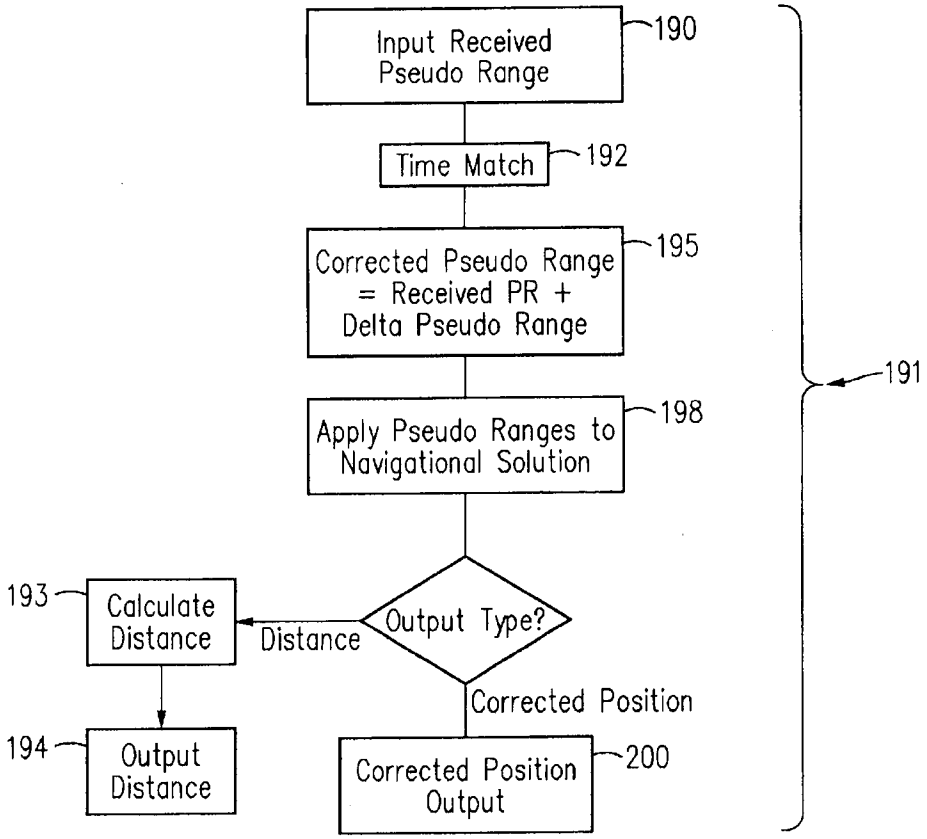

Input Received Pseudo Range
190
Time Match
192
Corrected Pseudo Range = Received PR + Delta Pseudo Range
195
Apply Pseudo Ranges to Navigational Solution
198
191
Output Type?
Distance
193
Calculate Distance
Corrected Position
194
Output Distance
Corrected Position Output
200

FIG. 10

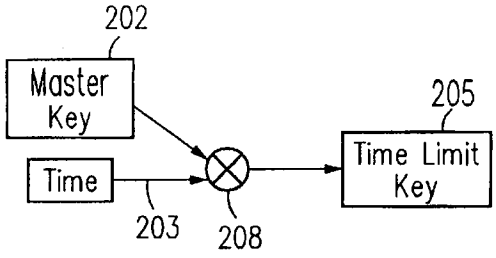

202
Master Key
205
Time
Time Limit Key
203
208

FIG. 11

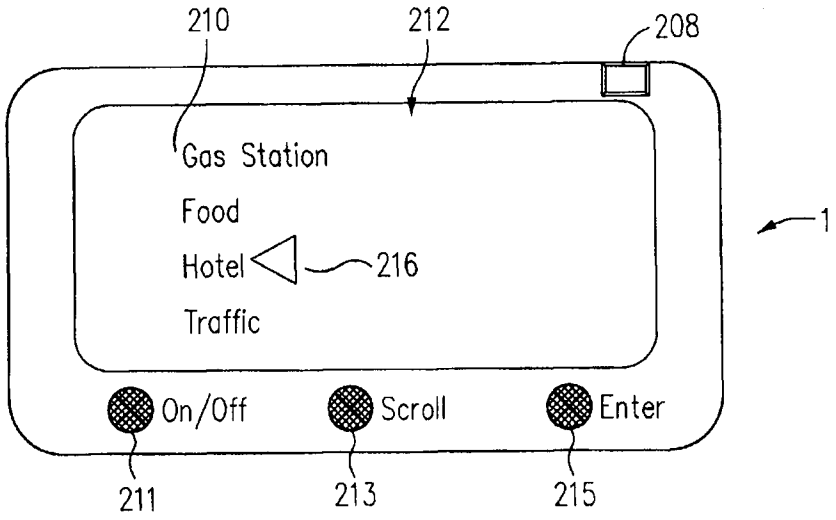

210
212
208
Gas Station
Food
Hotel
216
Traffic
1
On/Off
Scroll
Enter
211
213
215

FIG. 12

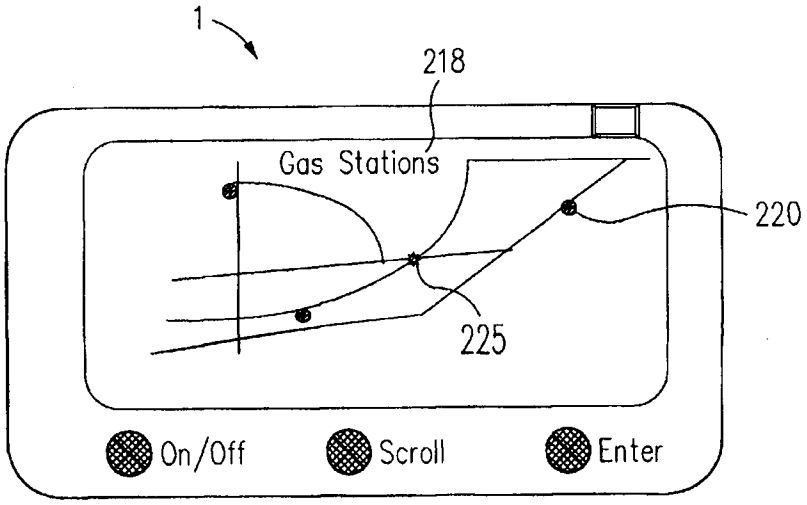

1
218
Gas Stations
220
225
On/Off
Scroll
Enter

FIG. 13

# METHOD AND STRUCTURE FOR DISTRIBUTION OF TRAVEL INFORMATION USING NETWORK

## BACKGROUND OF THE INVENTION

1. Field of Invention

This invention relates to a system and a method for locating vehicles, and more particularly to a system and a method which use a data network, such as the Internet, to monitor vehicle movements and to transmit travel-related information to vehicles.

2. Description of the Related Art

The global position system ("GPS") is used for obtaining position information. A GPS receiver receives ranging signals from several GPS satellites, and triangulates these received ranging signals to obtain the measured position of the receiver. A more detailed discussion of a GPS receiver is found in U.S. patent application ("Copending Application"), Ser. No. 08/779,698, entitled "Structure of An Efficient Global Positioning System Receiver," attorney docket no. M-4578, assigned to the present assignee. The Copending Application is hereby incorporated by reference.

One application of GPS is vehicle location. A conventional vehicle locating system typically includes one or more ground stations and many mobile units installed on the vehicles. In such a system, each mobile unit is equipped with a GPS receiver and a wireless transmitter. Using the GPS receiver, a mobile unit determines the position of the vehicle and then transmits the position directly to a ground station. The ground station receives the positions of all vehicles, and displays these positions on a digital map on a display device. The ground station of a conventional vehicle locating system normally also includes a map database search system, a media reader (e.g., a CD-ROM drive) and media (e.g., CD-ROMs) that store digital maps and travel-related information. Using the stored digital maps and positioning information received from the GPS satellites, the operator of the ground station can determine a present position for the vehicle.

The conventional vehicle locating system described above has several limitations. First, a direct wireless communication link between a vehicle and the ground station is required. Such a communication link is expensive, especially for long-distance communication. Further, special software must be installed on each ground station which adds to time and money costs. Thus a conventional vehicle locating system is impractical for a small company that has only a small number of vehicles.

Secondly, conventional vehicle location systems are not standardized. Typically, a company using a vehicle locating system must devise its own map software and create its own digital maps. The amount of information that is available on a conventional vehicle locating system is limited by the capacity of the storage system. In addition, information in such a system is often updated by creating a new CD-ROM. Statistical information, such as traffic condition and traffic patterns of the routes, is typically not available because each operation is independent and isolated from the other.

## SUMMARY OF THE INVENTION

According to the present invention, a data network, such as the Internet, is involved in locating mobile units. In one embodiment of the present invention, using a GPS receiver, position information of a mobile unit is determined from positioning signals received from GPS satellites and pseudo-ranges derived from the positioning signals. The GPS receiver triangulates the pseudo-ranges to obtain a measured position of the mobile unit. The measured position is then transmitted via a data network to a data processing station. The data processing station organizes the measured position and generates an area map which indicates by a position marker the position of each mobile unit. This are a map is made available to one or more monitor units connected to the data network.

In an other embodiment, using a GPS receiver, the mobile unit receives ranging signals from GPS satellites and calculates the pseudo-ranges to these satellites. These pseudo-ranges are then transmitted to the data processing station, where the measured position of the mobile unit is obtained through triangulation. Alternatively, the pseudo-range information is encrypted before transmission to the data processing unit to prevent unauthorized use. In another embodiment, the measured position is also corrected at the data processing station using differential correction data collected from a differential correction station installed in the same area where the mobile unit is located. A mobile unit may also send a request for a database search through the data network to the data processing station to obtain an area map or travel-related information.



## BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** illustrates a vehicle locating system which includes a data network **27**, according to the present invention.

FIG. **2** illustrates a data processing station **18** in a vehicle location system of the present invention.

FIG. **3** illustrates a program flow in a mobile unit of the present invention.

FIG. **4** illustrates a program flow in a data processing unit of the present invention.

FIG. **5** is a block diagram of a mobile unit of the present invention.

FIG. **6** is a block diagram of a data processing unit of the present invention.

FIG. **7** represents one implementation of position table **33**.

FIG. **8** illustrates a pseudo-range table **40** for indicating the pseudo-ranges of a mobile unit over a period of time.

FIG. **9** represents one implementation of delta-pseudo-range table **39**, containing delta-pseudo-ranges obtained from various service areas.

FIG. **10** illustrates the logic flow of a differential correction process according to the present invention.

FIG. **11** illustrates a process for generating a time-limited key from a master key and a specified duration.

FIG. **12** illustrates one display in a mobile unit according to the present invention.

FIG. **13** illustrates one display in a mobile unit according to the present invention, specifically displaying a map with travel information overlaid thereon.

## DETAILED DESCRIPTION OF THE INVENTION

FIG. **1** illustrates a system of the present invention which includes a data network. As shown in FIG. **1**, a vehicle locating system according to the present invention includes GPS satellite constellation **8**, data network **27** with nodes **5**, **10**, **12** and **15**, data processing station **18**, monitor unit **22**, and mobile units **1** and **3**. Mobile unit **1** is a portable (e.g., handheld) device while mobile unit **3** is installed in a vehicle. Mobile units **1** and **3** each include a GPS receiver,

a transmitter for transmitting messages to the data network, and a microprocessor. Each mobile unit can also be provided a data receiver for receiving messages from the data network. Mobile units may fall into different groups, which requires different handling procedures. For example, it may be convenient to group moving companies separately from taxi companies. Monitor units perform system-wide or regional control and data-gathering functions. The following description uses mobile unit **1** as an example of the mobile units of the present invention.

The mobile unit of the present invention allows a user to report his/her position and to obtain travel-related information over a data network. Travel-related information includes such information as directions to reach a destination (e.g., a gas station, a hotel, or a restaurant), or traffic conditions in the immediate vicinities of concern. Using a GPS receiver, mobile unit **1** receives a positioning signal which contains code sequences from GPS satellite constellation **8** and converts the code sequences into pseudo-range information. When the operator of the mobile unit wishes to request the travel-related information, a query is sent in an outbound data package. The outbound data package includes the operator's query, the pseudo-ranges and a time-stamp indicating the time the pseudo-ranges were obtained. (In this detailed description, an outbound data package refers to a data package transmitted from a mobile unit.) A history showing the most recent positions of mobile unit **1** may also be included in the outbound data package. In this embodiment, data processing station **18** keeps track of the time since the last update. The outbound data package is then transmitted by the mobile unit's transmitter over wireless link **23** to a service connection **10** on data network **27**, which relays the outbound data package to data processing station **18**. Alternatively, instead of sending the pseudo-ranges as described above, mobile unit **1** obtains a "measured" position using a triangulation technique on the pseudo-ranges. This measured position of mobile unit **1** is then included in an outbound data package. The outbound data package also includes a position update request or query, together with the pseudo-ranges or the measured position. Mobile unit **1** reports its position either automatically, according to a predetermined schedule, or manually, through commands entered by an operator into the mobile unit. Wireless communication between the mobile unit and data network can be accomplished, for example, using a cellular digital packet data (CDPD) modem or via satellite.

FIG. **2** illustrates a data processing station **18** of the present invention, including a data process unit **38** which handles the computation at data processing station **18**. If data processing station **18** receives an outbound data package which includes a measured position of the mobile unit (presumably the position of the vehicle), the measured position is entered into a position table **33** (FIG. **2**). If the outbound data package includes pseudo-ranges, however, data processing station **18** obtains the measured position of the mobile unit for position table **33** by applying triangulation technique on the pseudo-ranges.

Alternatively, data processing station **18** can also use pseudo-ranges in conjunction with differential correction information, or delta-pseudo-ranges. The delta-pseudo-ranges, which are obtained by data processing unit **38** from correction stations (e.g., correction stations **37**) and stored in a delta-pseudo-range table (e.g., delta-pseudo-range table **39** of FIG. **2**), are correction factors for the geographical area in which the mobile unit is currently located. Data processing unit **38** can connect to correction stations **37** via wired or wireless communication links, or via a data network, such as data network **27**. The position of a differential correction station is precisely known. Typically, a differential correction station serves an area 200 miles in diameter. In the present embodiment, a differential correction station in each of the vehicle locating service's service areas is desired. The delta-pseudo-ranges are used in conjunction with the pseudo-ranges received from satellite constellation **8** to provide a corrected measured position of the mobile unit. The corrected measured position is then stored in position table **33** (FIG. **2**).

A differential correction station receives code sequences from GPS satellite constellation **8** (FIG. **1**) to obtain a first set of pseudo-ranges based on the received code sequences. The differential correction station then calculates a second set of pseudo-ranges based on its known position and the relative positions of the satellites in satellite constellation **8**. Delta-pseudo-ranges are then computed using the two sets of pseudo-ranges. These delta-pseudo-ranges are provided to data processing unit **38**, and stored in delta-pseudo-range table **39** for computing corrected measured positions of the mobile units. Alternatively, correction to the measured position can also be achieved using positional corrections, rather than delta-pseudo-ranges. To obtain a positional correction, a differential correction station receives GPS positioning code sequences, and obtains, based on the received code sequences, a measured position of its own position expressed in terms of the longitude and latitude. This measured position (called a "fix") is compared to the precisely known position of the differential correction station to obtain the positional correction expressed in a delta-longitude quantity and a delta-latitude quantity. To use these delta-longitude and delta-latitude quantities to find a corrected measured position of mobile unit **1**, the pseudo-range obtained by mobile unit **1** is first used to triangulate a measured position to obtain a raw position expressed in a raw longitude and a raw latitude. The corrected longitude for the mobile unit is this raw longitude plus the applicable delta-longitude obtained by the differential correction station in the vicinity. Likewise, the corrected latitude is the raw latitude of the mobile unit plus the delta-latitude computed by the differential correction station in the vicinity.

In addition to computing the corrected measured position, data processing station **18** searches a database **32** and associated area map storage **63** to process the operator's query received in the outbound data package. Database **32** maintains such travel-related information as maps, traffic situation in a particular area, positions of service stations and destinations of interest. Storage for database **32** can be implemented using any mass storage media, such as hard disks, RAMs, ROMs, CD-ROMs, and magnetic tapes. For example, infrequently updated information (e.g., maps or destinations of interest) can be stored on CD-ROMs, while frequently updated information (e.g., current traffic conditions) can be stored on RAM. Database **32** is accessed by data processing unit **38**.

Position table **33** stores the last known measured positions of the mobile units in the system. The measured position stored in positions table **33** can be used for compiling vehicle position maps by monitor units **22** (FIG. **1**). FIG. **7** represents one implementation of position table **33**. Position table **33** contains the measured positions of several mobile units, identified respectively by an identification number **160**, at particular times **162**. The measured position of each mobile unit is represented by a time-stamp **162**, a measured latitude value **165**, a measured longitude value **168**, and a velocity **170**.

Delta-pseudo-range table **39** stores the delta-pseudo-ranges of each service area. FIG. **9** represents one imple-

mentation of delta-pseudo-range table **39** used by data processing station **18** (FIG. **1**). As shown in FIG. **9**, delta-pseudo-range table **39** maintains the delta-pseudo-ranges **186** of each service area (indicated by identification **180**) from each of a group of satellites at each of the specified times **188**. Each value of the delta-pseudo-range data **186** indicates the delta-pseudo-range to a particular satellite. Area map storage **63** stores area maps with position markers indicating the mobile units and landmarks. The response to the query can be in text, graphical or audio form. If the query is for directions, for example, a map including the measured position or corrected measured position and the position of the destination is retrieved. Typically, a position marker is provided to identify the position of the requested destination. The map and a result of the database search (i.e., a response to the operator's query) are then packaged into an inbound data package, which is transmitted to mobile unit **1** through data network **27** via network connection **10** and wireless link **23**. (In this detailed description, an inbound data package refers to a data package received by a mobile unit or a monitor unit.)

Instead of computing the corrected measured position at data processing station **18**, a microprocessor in mobile unit **1** can also be used to compute a corrected measured position from pseudo-range information the mobile unit received from satellite constellation **8** and delta-pseudo-range information received from data processing station **18**. Under this arrangement, instead of the measured corrected position, data processing station **18** includes in the inbound data package the delta-pseudo-ranges for the current position of mobile unit **1**. In any event, upon receiving the inbound data package, mobile unit **1** displays on its screen the corrected measured position and the position of the destination, typically by overlaying the positions on the map received, along with the response to the query. For example, if the operator requests directions to a nearby gas station, a position marker identifying the gas station and a position marker identifying the mobile unit's current position are displayed on the map, together with the response to query (i.e., directions as to how to get to the gas station). The response to the query can be a text description or a graphical representation of the directions placed next to or overlaying the map. Alternatively, instead of sending the map the positions and the response to query in the inbound data package, data processing station **18** can provide in the inbound data package a picture file of the map, with the markers and the response to the query already embedded. Special markers can be used for indicating interesting conditions. For example, a mobile unit that has been stationary for a predetermined period of time can be marked by a special marker to signal monitor units of an exceptional condition. The picture file is then simply displayed by mobile unit **1**.

Data network **27** can be a wide area data network, such as the Internet, or a telephone network, including wired or wireless communications, or both. Data network **27** can also be accessed via a satellite link. For example, in FIG. **1**, satellite **5** provides access to data network **27**, communicating with mobile unit **3** through a wireless communication channel **25**. Satellite **5** allows the present invention to be used in a remote area where other forms of transceivers, such as cellular phone transceiver stations, are expensive to implement. In one embodiment, the inbound and outbound data packages are encrypted for security. One method of image encryption and decryption that can be used for this application is described in U.S. Pat. No. 5,541,993 by Eric Fan and Carey B. Fan, July 1996. This disclosure of U.S. Pat. No. 5,541,993 is hereby incorporated herein by reference. Service connection **10** can be a commercial transceiver station such as a cellular phone transceiver station. In another embodiment, service connection **10** is a dedicated transceiver station for the handling of communication related to the present invention.

In the embodiment shown in FIG. **1**, another set of terminals (e.g., monitor **22**) are provided in some applications to monitor the activities of the mobile units. For example, a monitor unit may send a request together with a mobile unit identification to data processing station **18** to obtain the measured position and speed of a specified mobile unit. One application for this capability can be found, for example, in a trucking company interested in tracking the positions of its fleet of trucks for scheduling and maintenance purposes. Monitor unit **22** can be a fixed unit or a portable unit. A portable monitor unit **22** is equipped with a wireless transceiver for accessing data network **27** via service provider **20** or wireless network service connection **10**. Monitor unit **22** may also communicate with mobile unit **1** through data network **27** using a message exchange protocol. For example, monitor unit **22** may send a special command to mobile unit **1**, and mobile unit **1** may send a message addressed to monitor unit **22**. In one example the message communicated between mobile unit **1** and monitor unit **22** is in the form of an electronic mail message. Of course, the communication between monitor unit **22** and mobile unit **1** can be encrypted for security or to prevent unauthorized use. Monitor unit **22** also displays the elapsed time since the last position update graphically (data collected by data processing unit). The elapsed time can be represented graphically as a color code, grades of shade, a flashing interval, or any suitable symbolic representation.

When the Internet is used as data network **27**, data processing station **18** is a node on the Internet and is assigned an Internet address. Monitor unit **22** can include a computer installed with a conventional web browser. The Internet address of data processing station **18** is used by the monitor unit for communicating with data processing unit **18**.

A land based vehicle normally travels a limited distance during a short time period. On the other hand, an area map showing the location of the vehicle is only useful when the vicinity of the vehicle is also shown. Consequently, a vehicle is often located in the area covered by the same map for the period of several position updates. This principle can be utilized to reduce the amount of data transmitted and thus improve the efficiency of the system.

According to the present invention, a plugin program for a web browser can be installed in monitor unit **22**. During each location update, the plugin program downloads the new location of the vehicle and compares the new location with the area map stored in monitor unit **22**. If the new location of the vehicle is within the boundary of the area map, a new location marker representing the vehicle is overlaid on the area map. If the location of the vehicle is outside the boundary of the area map, a new area map is downloaded and the location of the vehicle is marked on the new area map. The plugin program can be downloaded over the Internet from the vehicle location service provider, or can be loaded directly from software storage media.

FIGS. **12** and **13** shows one implementation of mobile unit **1** adapted for allowing an operator to send a travel-related query under the present invention. As shown in FIG. **12**, mobile unit **1** includes liquid crystal display (LCD) **212**, transceiver/antenna assembly **208**, power switch **211**, a scroll key **213**, and an "enter" key **215**. Scroll key **213** and

enter key **215**, in conjunction with a software-generated command menu **210** displayed on LCD **212**, allow the user to enter simple commands, such as the travel-related query described above. For example, as shown in FIG. **12**, command menu **210** shows selections "gas station," "food", "hotel", and "traffic". By pressing scroll key **213**, an operator of mobile unit **1** causes a cursor **216** to step through the selections. When the operator presses enter key **215**, an outbound data package including the query or command is transmitted by transceiver/antenna assembly **208** to processing station **18**. In this embodiment, as shown in FIG. **13**, the response from data station **18** is received in mobile unit **1** through transceiver/antenna assembly **208** and displayed on LCD **212**. In this instance, the query sent to data station **18** corresponds to the selection of "gas station". In FIG. **13**, data processing station **18** returns to mobile unit **1**, in an inbound data package, a map which is displayed on LCD **212**, showing the vicinity of mobile unit **1**. Mobil unit **1**'s position is indicated on LCD **212** by a marker **225**. The locations of several gas stations, indicated by markers **220** are also displayed.

FIG. **3** is a flow diagram showing the operation of mobile unit **1** (FIG. 1). At step **51**, one of four modes of operation is selected: periodic update mode **53**, route diversion triggered mode **62**, passive update mode **68**, minimum distance mode **66** and service mode **70**. Under periodic update mode **53**, mobile unit **1** periodically reports pseudo-ranges of its position to data processing station **18**, so as to update the measured position of mobile unit **1** stored at data processing station **18**. Under route diversion triggered mode **62**, mobile unit **1** reports its position only upon a diversion from a pre-programmed route or a diversion from a predetermined time schedule. Under update mode **68**, the position of mobile unit **1** is reported under an operator's control. Service mode **70** is not an operating mode, but is used to program mobile unit **1**.

Under periodic update mode **53**, at step **55**, mobile unit **1** waits for the next scheduled position update. At the time of a scheduled update, i.e., at step **58**, mobile unit **1** calls to establish network service connection **10** for accessing data network **27**, and transmits to data processing station **18** an outbound data package. Upon receiving the outbound data package, data processing station **18** responds to the operator's query by searching database **32**, updating a map retrieved from map storage **63**, and transmitting the map to mobile unit **1** an inbound data package.

Under route diversion triggered mode **62**, the measured position of mobile unit **1** is obtained at the mobile unit using pseudo-range data without differential correction. At step **65**, this measured position is compared with a pre-programmed route and a schedule. If the current position is a substantial deviation from the pre-programmed route or from the schedule, mobile unit **1** branches to step **55** to create a service connection **10** for performing the update described above at the next scheduled reporting time.

Under passive update mode **68**, a measured position update occurs when an operator issues an update request in an outbound data package. At step **69**, when an operator initiates an update request, mobile unit **1** branches to step **58** to create network service connection **10**. An outbound data package including the update request is transmitted via network service connection **10** to data processing station **18** over data network **27**.

Under minimum distance mode **66**, the distance traveled since the last update must exceed a threshold value before a new update is issued. Step **67** compares the distance traveled since the last update with the threshold value.

Under service mode **70**, an operator of mobile unit **1** can effectuate two major functions: route programming function **74** and password update function **72**. In route programming function **74**, the operator of mobile unit **1** enters a new route to replace a pre-programmed route in mobile unit **1**. In this description, a "route" connotes not only a series of physical coordinate sets marking the path of a vehicle, but also the time at which the vehicle is scheduled to arrive at or depart from each set of physical coordinates. In this embodiment, to operate mobile unit **1**, an operator must first be verified by supplying a password. The password can be modified under user password update mode **72**. At step **75**, the operator provides the current password to identify himself/herself, and to obtain authorization to modify the password. Typically, mobile unit **1** requests the operator to enter the new password twice to ensure that the new password is correctly entered. At step **85**, the successfully entered new password is written into storage, thereby superseding the old password.

FIG. **4** illustrates a flow diagram of a data processing program used by data processing station **18** (FIG. **1**). Beginning at step **90**, data processing station **18** receives either an outbound data package (step **100**) or a command from a monitor unit (step **122**), such as monitor unit **22**. If the received outbound data package includes a position update request (step **101**), the data processing program determines at step **102** whether a corrected measured position update is requested. If a corrected measured position update is requested (step **105**), the data processing program obtains the pseudo-ranges from the outbound data package and enters them into a pseudo-range table. An example of a pseudo-range table is provided in FIG. **8**. As shown in FIG. **8**, pseudo-range table **40** includes one entry for each mobile unit. Each entry of pseudo-range table **40** includes an identification **172**, pseudo-ranges (**175**) of the mobile unit to 8 satellites (PR1–PR8), and a time-stamp **178**, indicating the time at which the pseudo-ranges are taken.

FIG. **10** is a flow diagram of one implementation of a differential correction process **191**. As shown in FIG. **10**, at step **190**, the pseudo-ranges of a mobile unit are either received from an outbound data package or retrieved from pseudo-range table **40** of FIG. **8**. At step **192**, all delta-pseudo-ranges from delta-pseudo-range table **39** are examined to find the delta-pseudo-ranges from a differential correction station in the mobile unit's service area, and which have a time-stamp closest to the time-stamp of the pseudo-ranges of the mobile unit sending the query. At step **195**, the corrected pseudo-ranges for the mobile unit are obtained by adding to the pseudo-ranges of the mobile unit corresponding delta-pseudo-ranges. The corrected measured position of the mobile unit is then calculated at step **198** using the corrected pseudo-ranges. At step **199**, if it is decided that a corrected position is desired, the corrected position is provided at step **200**. If it is decided at step **199**, on the other hand, that a distance to a known position is desired, then the distance is calculated at step **193**, and is provided as output at step **194**.

Returning to FIG. **4**, at step **120**, data processing program retrieves from delta-pseudo-range table **39** a set of delta-pseudo-ranges for the mobile unit taken at the same time and in the same service area the pseudo-ranges of the requesting mobile unit were taken. At step **108**, the data processing program computes the corrected measured position using the pseudo-range and delta-pseudo-range information obtained at steps **101** and **120**. If a corrected measured position is not requested, steps **105** and **108** are skipped, and the data processing program enters the measured position of the mobile unit into position table **33**.

At step **111**, the data processing program links in database **32** the reporting mobile unit's updated measured position entry in position table **33** with the measured position entries of other mobile units in the reporting mobile unit's group. At step **112**, in this embodiment, the measured positions of the mobile units in one linked group are associated with (or "overlaid on") a digital map, so that the positions and the identification of all vehicles of that group can be represented by position markers and text on the map. Such a map allows a manager of a group of vehicles to conveniently monitor the activities of the vehicles. At step **115**, the updated position of the mobile unit and the newly created associations among the mobile units and the digital map are replaced in database **32**. The data processing program then returns to step **90** to receive the next outbound data package or command.

As mentioned above, an outbound data package can contain a query for a database search, e.g. a request for directions to a nearby restaurant. When such a query is identified (step **92**), database **32** is searched for formulating a response at step **94**. To formulate the response, the data processing program uses the measured position of the requesting mobile unit and other relevant positional information. The response is returned in an inbound data package to the requesting mobile unit at step **96**.

The data processing program can also receive a request from monitor unit **22**. Typically, such a request is provided with an authentication key over data network **27** (FIG. **1**). At step **123**, the authentication key, hence the identity of the requesting monitor unit, is verified. The authentication key allows the requesting monitor unit access to the records of a specific mobile unit or a specific group of mobile units. To enhance security, authentication keys can be made time-limited, i.e., each authentication key is valid only for a specified duration. FIG. **11** shows a process for making a time-limited key. As shown in FIG. **11**, using a mixing function represented by reference numeral **208**, a master key **202** (which identifies the owner) is mixed with a value representing a time duration **203**. The resulting value **205** serves as a time-limited authentication key over the specified time duration. Security is enhanced since forging a valid time-limited authentication key requires both knowledge of the master key and the value representing the time duration for which the key is valid.

At step **125**, if the verification is successful, the data processing program responds to the request. In one embodiment, a digital map (e.g., the one created above at step **112**) providing the positions of a group of vehicles is returned at step **126** to the requesting monitor unit.

FIG. **5** is a block diagram of a mobile unit, such as mobile unit **1**. As shown in FIG. **5**, mobile unit **1** has three functional sections: GPS receiving section **131**, control section **133**, and communication section **144**. GPS receiving section **131** includes GPS antenna **130** for receiving and providing GPS ranging signals to receiving circuit **132**, which processes the received GPS ranging signals to obtain a pseudo-range to each of the GPS satellites within mobile unit **1**'s line of sight. Control section **133** includes a microprocessor **135**, input device **140**, display device **142**, and memory device **138**. Input device **140** is an optional feature which allows commands and requests to be entered. Input device **140** can be a keyboard, a mouse, a track ball, a pressure sensitive display panel, or any combination of these and other input devices. Display device **142** is also an optional device, which is used to provide visual responses to entered commands and requests, and to display relevant information (e.g. query response from data processing unit **18**, or a command from monitor unit **22**). The pseudo-ranges from GPS receiving section **131** are provided to control section **133**, where the pseudo-ranges are combined with an update request or a query in an outbound data package for data processing station **18**. The outbound data packages are transmitted to data processing station **18** by wireless transceiver section **144**. Wireless transceiver section **144** includes a wireless modem circuit **146** with an antenna **145** or, alternatively, a wireless telephone network interface **148**. Wireless modem circuit **146** receives an outbound data package from control section **133** for transmission to data network **27** through modem antenna **145** and a wireless network service connection, such as service connection **10** (FIG. **1**). Alternatively, wireless modem circuit **146** provides the outbound data package to data network **27** over wireless telephone network interface **148** via service connection **10**. Depending on the application, control section **133** may or may not be programmed for receiving an inbound data package from wireless transceiver **144**. For example, if mobile unit **1** is used only for reporting position, control section **133** need not be programmed to receive inbound data packages.

FIG. **6** is a block diagram of a data processing unit, e.g. data processing unit **38** of FIG. **2**. Data processing unit **38** includes a network interface **150** for interfacing data processing unit **38** with data network **27**, a data processing computer **152** for providing the computational power for processing operator query and performing position update requests, and a memory system **155**. A data router **151** can be provided between network interface **150** for connecting data processing computer **152** to a local area network.

The principles of the present invention can be applied to a wide variety of services. For example, a courier service company may provide a mobile unit to each of its delivery persons. A delivery person may use the mobile unit to obtain directions to a destination. A time-limited key may be issued to a customer, who can then use the time-limited key to track the delivery of his/her package through data processing station **18**. In this instance, the customer plays the role of monitor unit **22** described above. As described above, monitor unit **22** may access data processing station **18** through the Internet. With the time-limited key, the customer can obtain the present position of the package, monitor the performance of the courier company, and estimate the expected arrival time of the package at the destination. Further, the customer may also send additional or alternative instructions to the delivery person (e.g., he/she may instruct the delivery person to abort the delivery, or to re-route the package to a new destination). The time-limited key issued to the customer expires when the package is delivered, or when a certain amount of time has passed.

The present invention allows even small companies with limited resources to have the benefits of a vehicle locating system, even when the vehicles tracked are few and scattered over a large geographical area. Since a data network, such as the Internet, is used in the present invention, the hardware investment for such use is minimal, as compared to prior art vehicle location systems.

As another example, a vehicle rental company may install mobile units on its vehicle fleet. The speeds and measured positions of these vehicles can thus be monitored using a monitor unit. In yet another example, a metropolitan bus company may install mobile units on its buses, and set the mobile units to route diversion triggered mode **62** discussed in conjunction with FIG. **3** above. When a bus is not running according to schedule, or deviates from a designated route, the mobile unit signals a dispatcher immediately. Timely remedial measures can thus be carried out.

In another application of the present invention, pseudo-ranges or measured position information transmitted from mobile units are used to calculate the speeds at which the vehicles travel. This information is compiled into database **32** at data processing station **18**, and made available for access through monitor units, such as monitor **22**. Such information allows shipping companies to route their vehicles away from traffic congestions and diversions. Radio stations or television stations can access this database from which to report traffic conditions. The information can also be used by municipal authorities in studying traffic patterns of selected vicinities to assist in planning new infrastructures.

When the Internet is used as data network **27** (FIG. **1**), the necessary hardware and software for implementing a monitor unit are readily available. Most computers that have the ability to access the Internet, together with a standard web browser, can be used to access data processing station **18** to perform the functions of the monitor units described above. Since a monitor unit can receive a map from data processing station **18**, such as the map displayed on LCD **212** in FIG. **13**, which can be displayed using conventional graphics software, the monitor unit is not required to be equipped with any special map software or a map database. Because the cost of communication on Internet is inexpensive, a vehicle monitoring system according to the present invention can be deployed on a world-wide basis at minimum cost. With increased bandwidth in data network **27**, the present invention can also be used in aircrafts, ships and other vessels for navigational purposes. Therefore, even though the present invention is described using the above examples, the scope of the invention is not limited by these examples. Numerous variations and modifications are possible within the scope defined by the following claims.

We claim:

**1**. A vehicle locating system comprising:

a data processing station connected to a data network accessible by wireless communication, said data processing station having a database including maps; and

a mobile unit including a global positioning system (GPS) receiver and a wireless transmitter, said receiver receiving positional information from GPS satellites and transmitting said positional information to said data processing station via said data network; wherein when said data processing station receives said positional information, said data processing station computes a measured position for said mobile unit, stores said measured position of said mobile unit in said database, associates said measured position of said mobile unit with a map in said database, creates from said may a second map embedded therein a marker indicating said measured position of said mobile unit, and provides said second map for display through a data network.

**2**. A vehicle locating system as in claim **1**, further comprising a monitor unit accessing said data processing station via said data network for said positional information of said mobile unit.

**3**. A vehicle locating system of claim **1**, wherein said mobile unit transmits said positional information to said data processing station using an encryption.

**4**. A vehicle locating system of claim **1**, wherein said positional information includes a time-stamp indicating the time when the positional information was received.

**5**. A vehicle locating system of claim **2**, wherein said data processing station associates said measured position of said mobile unit with a map in said database.

**6**. A vehicle locating system of claim **1** further comprising a monitor unit, wherein said second map is provided to said monitor unit for display.

**7**. A vehicle locating system of claim **6**, said mobile unit further including a display device, said mobile unit displaying graphically an elapsed time since its last transmission of said positional information to said data processing unit.

**8**. A vehicle locating system of claim **7**, wherein monitor unit displays said elapsed time using a symbolic representation.

**9**. A vehicle locating system of claim **1**, wherein said data processing unit receives correctional data from a differential correction data source, wherein said data processing station computes a corrected measured position of said mobile unit using said correctional and said positional information received from said mobile unit.

**10**. A vehicle locating system of claim **1**, wherein said mobile unit transmits said positional information to said processing data station at predetermined time intervals.

**11**. A vehicle locating system of claim **1**, wherein said data processing station marks in said map a mobile unit that remains stationary over a predetermined time period with a symbol indicating an exceptional condition.

**12**. A vehicle locating system of claim **2**, wherein said data processing station verifies communication from a monitor unit by an authentication scheme.

**13**. A vehicle locating system of claim **1**, wherein said mobile unit is assigned a route, wherein said mobile unit transmits said positional information to said data processing station when said mobile unit deviates from said assigned route.

**14**. A vehicle locating system of claim **1**, wherein said data network comprises a publicly shared network such as the Internet.

**15**. A vehicle locating system of claim **14**, wherein said data processing station receives said positional information from a plurality of mobile units, and wherein said data processing station compiles statistical data from said positional information received from said mobile units.

**16**. A vehicle locating system of claim **15**, wherein said statistics includes traffic condition statistics compiled from said positional information.

**17**. A vehicle locating system of claim **15**, wherein said data processing station compiles statistics relating to vehicle usage and drivers habit.

**18**. A vehicle locating system of claim **15**, wherein said statistics relates to traffic pattern on a particular route.

**19**. A vehicle locating system of claim **15**, wherein said data processing station compiles a travel history for a vehicle on which said mobile unit is placed to establish a report on said vehicle.

**20**. A vehicle locating system of claim **19**, wherein said data processing stations schedules vehicle maintenance according to travel history information provided by said positional information.

**21**. A vehicle locating system of claim **14**, wherein said mobile unit automatically initiates a position update when a distance traveled since last update exceeds a pre-determined value.

**22**. A vehicle locating system of claim **14** further comprises a monitor unit connected to said network, wherein said monitor unit causes said mobile unit to initiates a position update.

**23**. A vehicle locating system of claim **14** further comprising:

a monitor unit connected to said network; and

a message exchange protocol implemented on said network to allow digital data message exchange between said monitor unit and said mobile unit.

**24**. A vehicle locating system of claim **9**, wherein said data processing station further computes a distance of said mobile unit to a designated location.

25. A vehicle locating system in claim 14, wherein said wireless communication comprises communicating using a cellular digital packet data (CDPD) protocol.

26. A vehicle locating system in claim 14, wherein said wireless communication comprises communication via a cellular telephone modem.

27. A vehicle locating system in claim 14, wherein said wireless communication comprises communication over a satellite data link.

28. A vehicle locating system in claim 14 further comprises a monitor unit, wherein said monitor unit is installed on a moving vehicle and is connected to said data network through a wireless data communication link.

29. A vehicle locating system in claim 14 further comprises a monitor unit connected to said data network, wherein said data processing station provides a monitor unit a key valid for a limited time to allow said monitor unit access to said data processing station for a limited time.

30. A vehicle locating system of claim 28, wherein (a) said database further comprises travel-related information and said mobile unit having a receiver for receiving wireless communication, (b) said mobile unit transmits to said data processing station a query for travel-related information; and (c) in response to said query, said data processing station retrieves said travel-related information from said database and transmits said travel-related information to said mobile unit.

31. A vehicle locating system of claim 16, wherein, said traffic condition statistics are organized by geographical areas.

32. A vehicle locating system of claim 31, wherein said data processing station causes said traffic condition statistics to be transmitted to said mobile unit in a form that can be played as an audio message.

33. A vehicle locating system of claim 30, wherein said data processing station provides, in response to said query, a map showing a route including the measured position of said mobile unit.

34. A vehicle locating system of claim 30, wherein said data processing station provides said travel-related information in the form of a map relating to the positional information of said mobile unit, said data processing station providing on said map markers indicating locations of interest.

35. A method for locating a mobile unit, comprising the steps of:

receiving in a mobile unit global positioning signals transmitted by global positional system (GPS) satellites to derive a set of positional data representing the position of said mobile unit relative to said satellites;

transmitting said positional data to a data processing station through a data network;

receiving in said processing data station said positional data and storing said positional data in a database for later retrieval;

retrieving said positional data in said processing station and computing a measured position of said mobile unit;

creating a map embedded therein a marker indicating said measured position of said mobile unit; and

providing said map by said processing station for display through said data network.

36. A method as in claim 35, wherein said positional data comprises pseudo-ranges.

37. A method as in claim 36, further comprising the steps of:

converting said pseudo-range data into a measured position for said mobile unit; and

storing said measured position in said database.

38. A method as in claim 37, further comprising the steps of:

receiving differential correction data from a differential correction station,

using said differential correction data and said pseudo-range data received from said mobile unit to calculate a corrected measured position of said mobile unit; and

storing said corrected measured position of said mobile unit in said database.

39. A method as in claim 35, wherein said data network comprises the Internet.

40. A method for calculating a corrected measured position of a mobile unit at a data processing station, comprising the steps of:

at said mobile unit, receiving global positioning system (GPS) data signals from GPS satellites;

sending said positional information to said data processing station;

at said data processing station, receiving differential correction data corresponding in time to said positional information from a differential correction station;

sending said differential correction data to said mobile unit; and

at said mobile unit, calculating said corrected measured position of said mobile unit; based on said positional information and said differential data.

41. A method as in claim 40, further comprising the step of calculating a distance between the corrected measured position of the mobile unit and a pre-determined geographical position.

42. A vehicle locating system of claim 14, further comprising a monitor unit accessing said data processing station through said data network for said positional information and said maps associated with said mobile unit, wherein said monitor unit further comprises an Internet browser program and a plugin program interfaced with said Internet browser program, said plugin program is used for managing positional and map data.

43. A vehicle locating system of claim 42, wherein said monitor unit further having an area map on which location of said mobile unit is marked, said Internet browser program downloads an updated location of said mobile unit, said plugin program compares said updated location with said area map to determine whether or not a new area map needs to be downloaded from said data processing station.

44. A vehicle locating system of claim 23, wherein said digital data message is in the form of an electronic mail message.

* * * * *

US005930723A

# United States Patent [19]

Heiskari et al.

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[45] Date of Patent: Jul. 27, 1999

[54] **ESTABLISHING AN EXPANDED GROUP CALL IN A MOBILE COMMUNICATION SYSTEM**

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PCT Pub. Date: **Apr. 25, 1996**

[30] **Foreign Application Priority Data**

Oct. 18, 1994 [FI] Finland ..... 944887

[51] **Int. Cl.**[6] ..... **H04Q 7/38**

[52] **U.S. Cl.** ..... **455/518**; 455/519; 455/520

[58] **Field of Search** ..... 455/507, 508, 455/517, 518, 519, 520, 524, 500, 521, 525, 527

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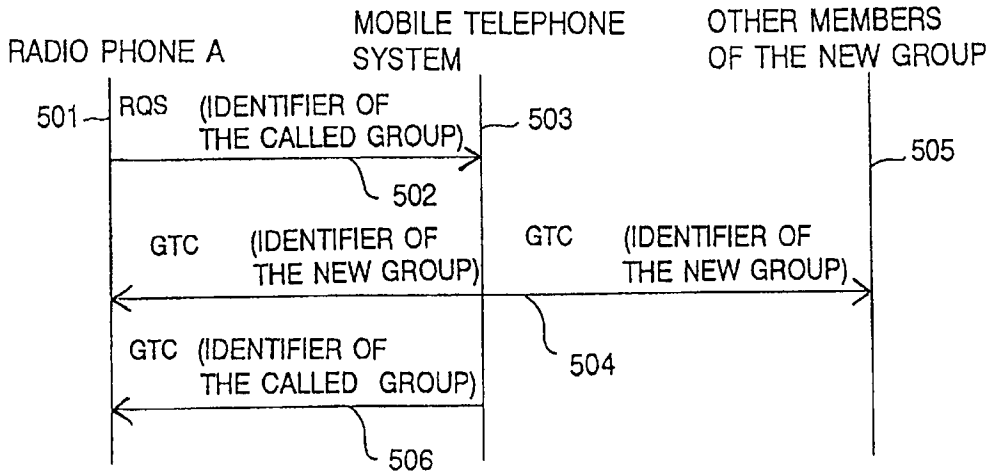
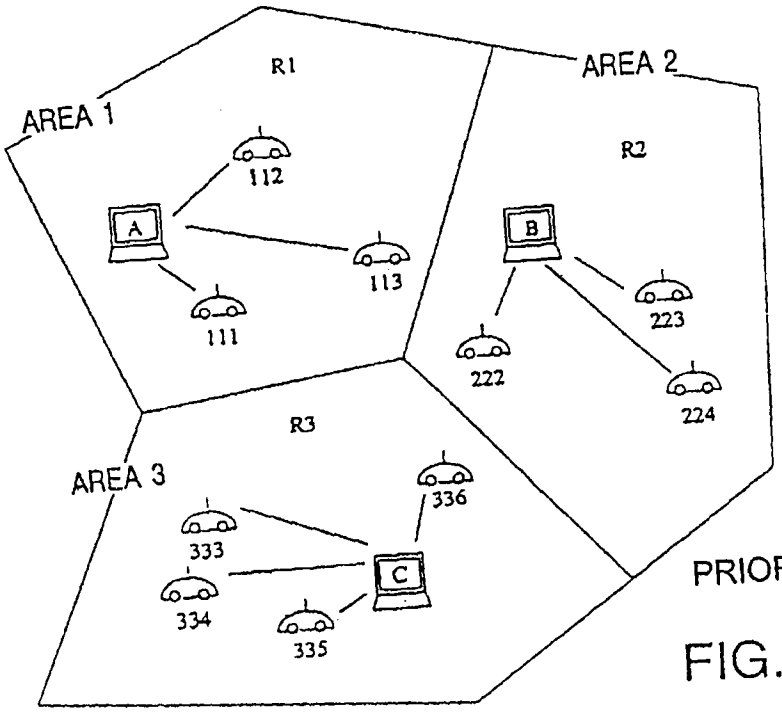
*Primary Examiner*—Reinhard J. Eisenzopf
*Assistant Examiner*—Edan Orgad
*Attorney, Agent, or Firm*—Pillsbury Madison & Sutro LLP

[57] **ABSTRACT**

For establishing an expanded group call in a mobile communication system which has group call groups formed by a plurality of mobile stations, a network infrastructure which has at least one exchange, a plurality of base stations and telecommunication connections between them, and a group call database for maintaining data concerning group calls, an expanded group call set-up facility concerning a first group call group is activated in the group call database, the facility expanding the group call o concern at least one other group call group. The network infrastructure receives a group call set-up request concerning the first group call group, the network infrastructure checks whether an expanded group call setup facility has been activated for the first group call group, calls the mobile stations of the first group call group and the mobile stations (**404**) of each at least one other group call group to the expanded group call to be established, and guides the respective mobile stations to communicate on one traffic channel at each base station of the expanded group call.

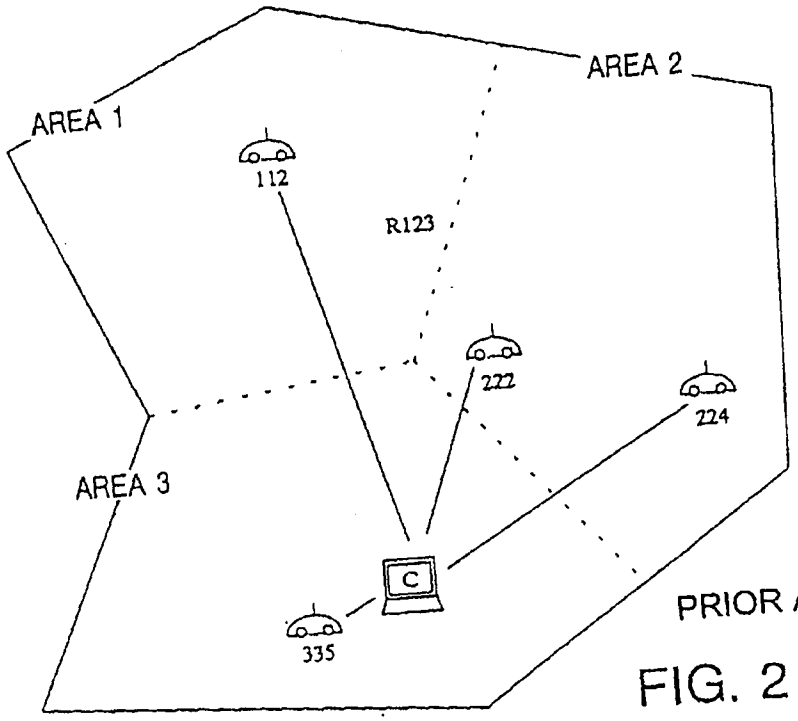
**11 Claims, 3 Drawing Sheets**





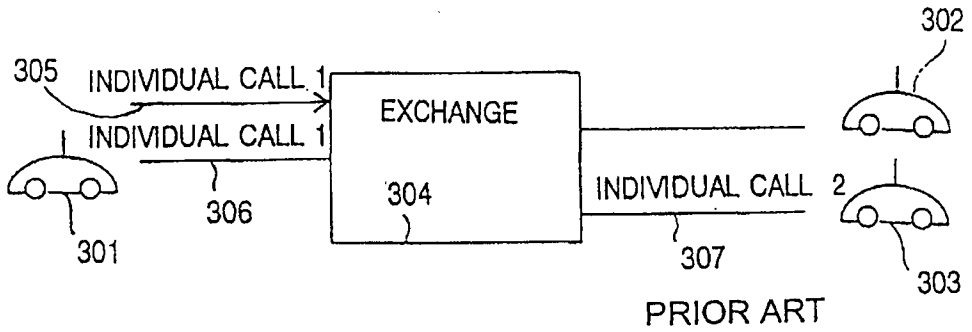

PRIOR ART

FIG. 1




PRIOR ART

FIG. 2




PRIOR ART

FIG. 3

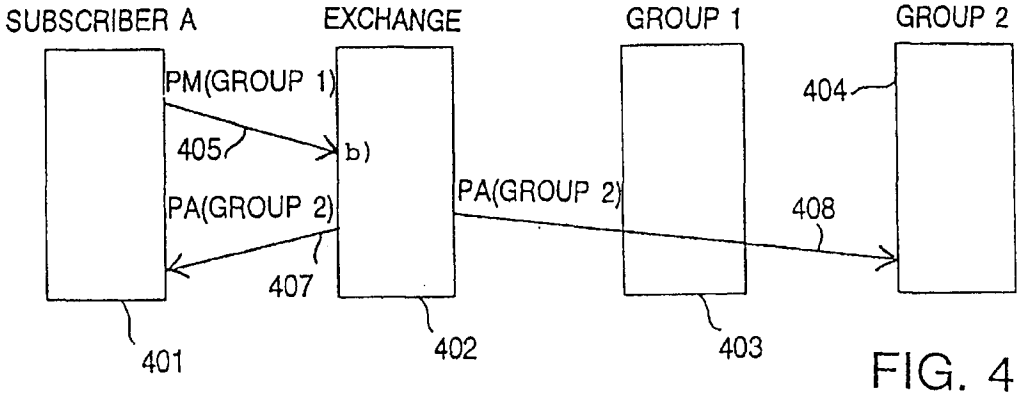



FIG. 4

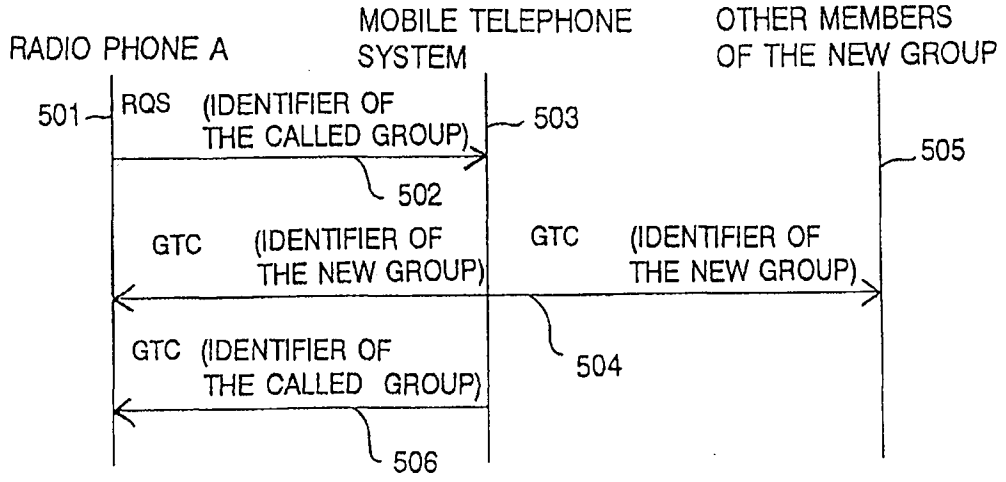



FIG. 5

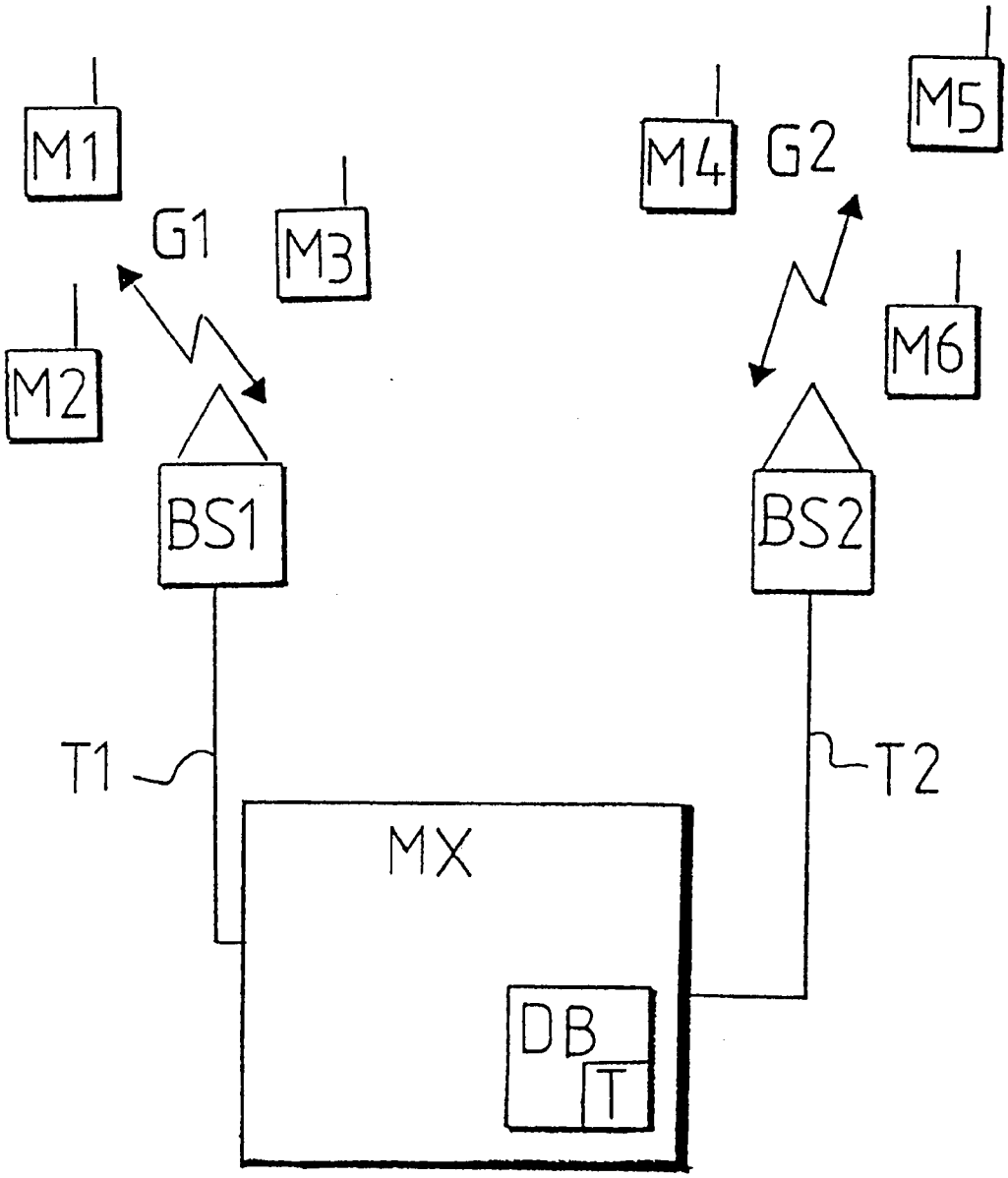



FIG. 6

# ESTABLISHING AN EXPANDED GROUP CALL IN A MOBILE COMMUNICATION SYSTEM

This application claims benefit of International application PCT/FI95/00570, filed Oct. 17, 1995.

## FIELD OF THE INVENTION

The invention relates to a method for establishing an expanded group call in a mobile communication system comprising group call groups formed by mobile stations, a network infrastructure comprising at least one exchange, base stations and the telecommunication connections between them, and a group call database for maintaining data concerning group calls.

The invention relates to mobile communication systems, especially mobile communication systems which comprise exchanges, base stations and radio phones, and which have a cellular structure and in each cell at least one base station communicating with at least one mobile station by means of one or more radio channels. One or several of the channels are typically used for signalling and the rest are utilized as traffic channels. The channels may be either time division or frequency division multiple access channels.

## BACKGROUND OF THE INVENTION

The method according to the invention is intended for use especially in trunked networks, which are typically networks of companies or authorities wherein all channels are used by one or several user organizations. In addition to their own subscriber numbers, the subscribers in these networks also have group numbers, which indicate the group call group or subscriber group the subscriber belongs to, so that calls intended for subscribers of a particular group can be forwarded to the subscribers in question.

The invention is applicable in both mobile communication systems with a digital radio path and systems with an analog radio path. Analog mobile communication systems are described for example in the following publications by the British Department of Trade and Industry: "MPT 1327, January 1988, Revised and reprinted November 1991, A Signalling Standard for Trunked Private Land Mobile Radio Systems, Radio-communications Agency" and "MPT 1343, January 1988, Revised and reprinted September 1991, Performance Specification, Radiocommunications Agency".

A group call is one of the central functions of a private mobile radio communication system. A group call is used, for example, in all kinds of operations with several participants, especially when an entire group must be continuously kept up to date in regard to certain events. A group call is a conference call wherein all participants can speak in their turn and also hear each other. In group calls, the entire group is called by using a single call number. An individual radio unit, such as a mobile station or a radio phone, i.e. a subscriber station, may belong to several groups that are programmed into the radio unit. The programming may be fixed, but the user of the mobile station may also change it. The system stores a file of the base stations associated with each group number. A group call may cover one, several or all base stations within the area of a mobile exchange, or several mobile exchanges. When a group call is being established, a traffic channel is reserved from all base stations belonging to the group, and each of these base stations transmits a group call message comprising a group number and information about the reserved traffic channel. If the mobile station identifies the group number contained in the group call message, it moves to the traffic channel indicated in the group call message. Therefore it is in principle always possible to engage a mobile station in a group call if the mobile station is within the area of operation predetermined for the group and if it is not already engaged in another group call.



In the following, the operation of a mobile communication system employing group calls is illustrated in a normal situation by means of FIG. **1**. In a normal situation, mobile stations must be able to communicate in a group call group comprising all radio phones and the dispatcher of the dispatching area (FIG. **1**). For example, radio phones **111**, **112** and **113** and dispatcher A in AREA 1 belong to group call group **R1**, and when they call each other they use the identifier of the group call group **R1**, i.e. they dial the number **R1**. The other dispatching areas AREA 2 and AREA 3 operate in the same manner with their own call group identifiers **R2** and **R3**.

FIG. **2** shows an example of the operation of a mobile communication system during an expanded group call, i.e. for example during night dispatching. Not all dispatchers are needed during such quiet periods of the user organization, for example at night, wherefore dispatching areas can be combined. FIG. **2** illustrates the combining of dispatching areas so that the dispatchers A and B have stopped operating and the group calls R1 and R2 previously under their control, as well as the corresponding geographical areas AREA 1, AREA 2,have been placed under the control of dispatcher C. In this application, night dispatching and an expanded group call hereinafter refer to a situation where dispatcher groups have been combined.

In a prior art system, night dispatching is realized, for example in such a manner that, in addition to the number of its own dispatcher group, the memory of mobile station also comprises the before-programmed number of the night dispatcher group. During night dispatching, radio phones dial the night dispatcher number. The drawback is that the users of the mobile stations must know exactly when to dial the number of their own dispatcher group, versus when is dial the number of the night dispatcher group. Also, it is then necessary to program beforehand into a radio phone the night dispatcher number, i.e. the group call number of an expanded group call, which is naturally difficult.

Another way of implementing the night dispatching or expanded group call facility is that separate dispatcher groups are interconnected in the mobile communication system so that it is always possible to dial the same dispatcher group number. Small dispatcher groups thereby still operate within their own areas.

The disadvantage of this arrangement is that the radio phones, i.e. mobile stations, may then operate only within their own small dispatching area. In prior art systems, the problem has been solved by programming the numbers of all small dispatcher groups into all radio phones of the night dispatcher groups. However, this always requires advance preparations and a lot of work, as well as expert programming of all mobile stations. In such a case, the user of a mobile station must decide himself or herself in which group call he or she wants to participate within each dispatching area, i.e. group call area. The disadvantage of the arrangement is that forming and changing the night dispatcher groups and areas is difficult, since the programming must be performed in each radio phone.

Another drawback is that when this arrangement is used, it is necessary to reserve several radio channels from each radio cell, i.e. base station, for the expanded group call to be

established, which necessarily wastes radio resources both in the form of channels and radio units maintaining them.

The functions of call diversion, i.e. call forwarding, and immediate call diversion that are shown in FIG. **3** are generally known in telephone technology. Call forwarding refers to a function by means of which calls to a subscriber can be transferred to the exchange or to another subscriber. FIG. **3** shows a first mobile station, i.e. subscriber A, **301**, an exchange **304**, a second mobile station **303**, and a third mobile station **302**.

In normal call forwarding, subscriber A **301** performs a call set-up request **305**, i.e. performs an individual call to establish a connection. Since the call forwarding facility is now activated, the exchange **304** then sets up two calls: call 1 **306** between subscriber A and the exchange, and call 2 **307** between subscriber C receiving the call to be transferred and the exchange. The exchange **304** connects these calls, and subscribers A and C may communicate with each other. The prior art call forwarding is reasonable in a wire network and also in individual calls in mobile communication systems. No call forwarding of group calls is known in prior art systems. If the prior art call forwarding were utilized in group calls, radio channel capacity would be wasted since two group calls must be established: the original requested group call and the new group call to which the original call is connected. If the group call groups that are to be connected to the same call are situated within the same geographical area in the mobile communication system, each group call must be provided with its own channel capacity at least partly within the same geographical areas, which in turn wastes channel capacity.

A mobile communication system implemented in the manner described above would work well if during an expanded group call to be established in a dispatching, for example night dispatching situation, the mobile stations would only have to communicate with the dispatchers. But if the mobile station initiating the call wants to set up a group call, i.e. if it must be able to communicate both with the dispatcher and with all other mobile stations belonging to the same group call group and situated in the area, the above-described arrangement is not sufficient.

## SUMMARY OF THE INVENTION

The purpose of the present invention is to avoid the problems of the above-described prior art arrangements.

The aim of the invention is to achieve a method and equipment providing a call forwarding method for a subscriber initiating a group call in a mobile communication system. The purpose is to provide a method wherein when subscriber A wants to initiate the first group call, in reality a second group call is started, i.e. call forwarding is performed in the group call.

The aim is to provide call forwarding in a group call in such a way that it is not necessary to reserve several channels at the same base stations for one group call established by means of call forwarding.

This new type of method for establishing an expanded group call in a mobile communication system is achieved with the method according to the invention, which is characterized in that, in the method, an expanded group call set-up facility concerning the first group call group is activated in a respective group call database, the facility extending the group call to concern at least one other group call group, the network infrastructure receives a group call set-up request concerning the first group call group, the network infrastructure checks whether an expanded group call set-up facility has been activated for the first group call group, calls the mobile stations of the first group call group and the mobile stations of at least one other group call group to the expanded group call to be established, and guides the mobile stations to communicate on one traffic channel at each base station of the expanded group call.

The invention also relates to a mobile communication system comprising group call groups formed by mobile stations, a network infrastructure comprising at least one exchange, base stations and the telecommunication connections between them, and a group call database for maintaining data concerning group calls.

The mobile communication system according to the invention is characterized in that in the system an expanded group call set-up facility concerning the first group call group is activated in a respective group call database, the facility extending the group call to concern at least one other group call group, the network infrastructure is adapted to check, in response to the group call set-up request concerning the first group call group, whether an expanded group call set-up facility has been activated for the first group call group, to call the mobile stations of the first group call group and the mobile stations of at least one other group call group to the expanded group call to be established, and to guide the mobile stations to communicate on one and the same traffic channel.

The invention is based on the idea that in realizing the expanded group call function, a call set-up request concerning the establishment of the first group call is changed to another group call request. By means of this request, a new group call concerning desired subscribers is established instead of the group call that was requested but will not be set up.

In protecting the invention, a group call set-up request is changed to another group call set-up request in such a way that a single radio resource is reserved at each base station in the system.

The advantage of such a mobile communication system and a method for establishing an expanded group call in a mobile communication system is that they solve the problems of the prior art arrangements.

Another advantage of the invention is that there is no need to program the mobile stations, i.e. radio phones, separately when the expanded group calls, i.e. dispatching areas, change.

A further advantage of the invention is that the users of mobile stations can always dial the same group call number regardless of the combining of the group calls, i.e. dispatching areas. Therefore the user does not have to know which dispatcher or group call request is being used at any given time.

An additional advantage of the invention is that if the dispatcher (dispatching point, control point) of a group call is damaged, a new dispatcher can be configured fast for the group call.

The invention is especially advantageous in mobile communication systems with several groups of users. When one user group is less active, another group may have a peak time in radio traffic. Such mobile communication systems often include especially private mobile radio systems used by the authorities. It is then possible to flexibly transfer radio resources at a given moment to the use of a user group which then has a peak time from a group call group that is less active. This means for example that it is possible to increase, for instance at night, the number of group call groups and subscribers participating in one group call, i.e. in group calls from which resources are to be taken.

## BRIEF DESCRIPTION OF THE DRAWINGS

In the following, the invention will be described in greater detail with reference to the accompanying drawings, in which:

FIG. **1** shows dispatching areas and group calls set up in the areas in a normal situation,

FIG. **2** shows combined dispatching areas and a group call set up in the areas in a situation of night dispatching,

FIG. **3** shows prior art call forwarding in case of an individual call,

FIG. **4** is a functional diagram of the method according to the invention for establishing an expanded group call in a mobile communication system,

FIG. **5** is a functional diagram of the method according to the invention for establishing an expanded group call in a mobile communication system wherein the mobile station initiating the call operates in such a way that it requires its own go-to-channel command to contain the identifier of the group call group the mobile station was calling, and

FIG. **6** is a block diagram of the mobile communication system according to the invention.

## DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS OF THE INVENTION

The expanded group call function according to the invention differs from the call forwarding function generally known in phone technology in such a way that in the arrangement according to the invention the new number is identifiable in the transmitted radio path signalling both to subscriber A initiating the call and to subscribers to be invited to the group call. On the other hand, in prior art call forwarding, the exchange sets up two separate calls, which appear separate in radio path signalling and which are connected together in the exchange. Therefore the prior art arrangement requires at least two channels.

FIG. **3**, described in the background part of the specification above, discloses the difference between the traditional call forwarding function and the function according to the invention. In conventional call forwarding, two separate radio connections are reserved, whereas in the implementation of the invention only one connection is reserved, which saves radio resources.

According to the invention, in case of an expanded group call the mobile communication system directs calls arriving from radio phones with the number of certain group calls, for example small dispatcher groups, to the number of a combined expanded group call group. The memory of each mobile station, for example a radio phone, contains programmed at least the number of its own dispatcher group, and in the first embodiment of the invention also the number of the night dispatcher group, i.e. expanded group call group. In the second embodiment of the invention, the only identifier which must be programmed into the first mobile station, i.e. subscriber A, is the identifier of the group call group the first mobile station is calling.

In FIG. **2** described above in the beginning of the specification, if the mobile station **224** makes its own group call R2 trying to reach, for example, dispatcher B by utilizing the group call number or phone number R2, the mobile communication system establishes an expanded group call R123, which is a combination of the group calls of groups R1, R2 and R3.

According to the invention, radio phones still dial the numbers they utilize during normal operation, i.e. **112** dials R1, **222** dials R2, etc. Therefore the mobile stations **112**, **222**, etc, do not need to know the identifier of the new expanded group call, but it is sufficient for them to call their own original group call groups.

FIG. **4** is a functional diagram of the method according to the invention for establishing an expanded group call in a mobile communication system. The figure shows the first mobile station **401**, i.e. subscriber A, which initiates a call. The figure also shows an exchange **402**, which describes the network infrastructure of the mobile communication system. The figure also shows in the form of blocks the first group call group **403**, i.e. group 1, and the expanded group call **404**, i.e. group 2, to be established according to the invention.

When the method according to the invention is applied, the first mobile station **401** transmits a group call set-up request **405** to the exchange **402**. The exchange checks the expanded group call set-up table of its group call database to find out whether an expanded group call set-up facility has been activated for the group call, and if it has, the exchange sets up an expanded group call **404** by transmitting a go-to-channel command **408** by means of which the desired subscribers are guided to the expanded group call to be established. The same command **408** is also transmitted **407** to the aforementioned first mobile station **401**.

In the following, the activation of the above-described night dispatching or expanded group call facility is disclosed according to the first embodiment of the invention. The facility is activated in such a way that a mobile station, i.e. a mobile station, a control point or some other terminal equipment or entity of the mobile communication system, transmits to the mobile communication system a message to activate the expanded group call facility. The activation message contains at least the following fields:

1. the identifier of the calling party,
2. a message identifier indicating that the message concerns the activation of the area group call facility,
3. a list of group numbers covered by the area group call facility, and
4. the identifier of the night dispatcher group, i.e. the expanded group call, i.e. the group number; the system knows beforehand the area of operation of the group in question.

When a mobile communication system has received an activation message it interprets it. If the calling party has the right to activate the night dispatching facility, i.e. the expanded group call, and all group numbers exist and can be connected by means of the expanded group call facility to the expanded group call group in question, the mobile communication system activates the expanded group call facility, for example the night dispatching facility. Otherwise, the message brings about no actions or it causes a negative acknowledgment to be sent. In the activation, the groups and the group number of the expanded group call group mentioned in the expanded group call message are stored in the group call database. The mobile communication system then transmits an acknowledgment message to the terminal equipment. The acknowledgment is positive if the expanded group call facility is activated and negative if no activation has been performed.

In the following, the operation of the expanded group call facility, e.g. night dispatching facility, of the first embodiment of the invention is described. In the beginning, a mobile station, for example a radio phone or some other terminal equipment, transmits a group call set-up request to the mobile communication system. The mobile communi-

cation system then interprets the received message and checks whether the group identifier requested in the received message is stored in the expanded group call set-up table according to the invention or not. If it is not, operation continues as usual and only the group call that was requested is established. If, on the other hand, the identifier of the requested group call is in the table, the method is continued in the following way. The mobile communication system, typically the exchange of its network infrastructure, reserves one traffic channel within the operation area of the expanded group call. The exchange of the mobile communication system then sets up an expanded group call in the operation area of the expanded group call. All group call groups mentioned in the expanded group call table are then called to the same expanded group call in the operation area of the call.

The elimination of the expanded group call facility according to the first embodiment of the invention is described below. A mobile station, a control point or some other terminal equipment in the mobile communication system transmits to the system a message to eliminate the expanded group call facility. The aforementioned message contains at least the following fields:

1. the identifier of the calling party,
2. a message identifier indicating that the message concerns the elimination of the area group call facility, and
3. the group number of the expanded group call group.

The mobile communication system interprets the received message. If the calling party has the right to eliminate the expanded group call facility, the system eliminates the facility. Otherwise, the message brings about no actions. When the expanded group call facility is eliminated, the expanded group call table is emptied. The mobile communication system then transmits an acknowledgment message to the terminal equipment. The acknowledgment is positive if the expanded group call facility has been eliminated, and negative if no elimination has been performed.

Both in radio phones operating in accordance with the prior art and in radio phones operating according to the first embodiment of the invention, the number of the dispatcher group and the number of the expanded group call group are programmed into the memory.

The implementation according to the second embodiment, of the invention is described below. In this embodiment mobile stations still call their own dispatcher numbers (for example in area 1 in FIG. 2: number R1, etc). Within the entire expanded group call area, the mobile communication system establishes a combined expanded group call to which all dispatcher groups of different areas (AREA 1, AREA 2, AREA 3) are commanded. In FIG. 2, if the mobile station 222 wants to communicate with the other mobile stations, the dispatcher or other participants, such as fixed network subscribers, of a group call, within the entire expanded group call area, it dials the number R2. The mobile communication system then sets up a combined group call in the entire expanded group call area, the group call groups R1, R2 and R3 being commanded to this call. In this embodiment, the only number that has to be programmed into the radio phones is the number of their own dispatching area. Changing dispatching areas is thus easy and the mobile stations can always call the same dispatcher number. Therefore the users of the mobile stations do not need to know the expanded group call identifier or the time the expanded group call must be requested, but the mobile communication system attends to these tasks.

The activation of the expanded group call facility according to the second embodiment of the invention is described below in detail. A mobile station, a control point or some other terminal equipment connected to the mobile communication system transmits to the system a message to activate the expanded group call facility. This message contains at least the following fields:

1. the identifier of the calling party,
2. a message identifier indicating that the message concerns the activation of the area group call facility, and
3. a list of group call numbers covered by the expanded group call facility.

The mobile communication system then interprets the received message. If the calling party has the right to activate the expanded group call facility and all the group call numbers exist and can be connected to the expanded group call facility, the mobile communication system activates the facility. Otherwise, the message brings about no actions or it causes a negative acknowledgment to be sent. In the activation, the groups mentioned in the expanded group call message are stored in the expanded group call set-up table. The mobile communication system transmits an acknowledgment message to the terminal equipment. The acknowledgement is positive if the expanded group call facility is activated, and correspondingly negative if no activation has been performed.

The operation of the expanded group call facility according to the second embodiment of the invention is described below. A radio phone or some other terminal equipment transmits to the mobile communication system a group call set-up request for a desired group. The mobile communication system then interprets the received message and checks whether the group call identifier contained in the received message (call) is stored in the expanded group call set-up table. If it is not, operation continues as usual and only the group that was requested is formed. If the group call group identifier is found from the aforementioned table, the mobile communication system interprets the operation area of the expanded group call on the basis of the table. It is a union of the group call areas of all groups in the night dispatching table, i.e. the expanded group call set-up table. The system also examines which group calls must be called to the expanded group call to be established. The mobile communication system reserves one traffic channel within the operation area of the entire expanded group call. The mobile communication system commands the first group onto this channel in accordance with the expanded group call table. The mobile communication system then commands the rest of the groups, one by one, onto the same traffic channel, i.e. to the same call. All the groups mentioned in the expanded group call table are then in the same call within the operation area of the expanded group call group.

The elimination of the expanded group call facility according to the second embodiment of the invention is described below. In the method, a mobile station, a control point or some other terminal equipment of the mobile communication system transmits to the system a message to eliminate the expanded group call facility. This message contains at least the following fields:

1. the identifier of the calling party,
2. a message identifier indicating that the message concerns eliminating the area group call facility, and
3. a list of group numbers covered by the expanded group call facility.

The mobile communication system then interprets the received message. If the calling party has the right to eliminate the expanded group call facility and the group numbers are identical with the groups numbers in the

expanded group call set-up table, the mobile communication system eliminates the expanded group call facility. Otherwise, the message brings about no actions. When the expanded group call facility is eliminated, the expanded group call table is emptied for the group call group in question. The mobile communication system then transmits an acknowledgment message to the terminal equipment. The acknowledgment is positive if the expanded group call facility has been eliminated, and correspondingly negative if no elimination has been performed.

The implementation of the above-described embodiments of the invention in modern mobile telephone systems is described below with reference to FIG. **5**. The background of the matter is disclosed for example in MPT Standard 1327, Chapter 9, especially Item 9.2.1.2.d, and Chapter 5.4. According to the MPT Standard 1327 describing analog radio phone networks, the signalling between the radio phone A initiating the call, the mobile communication system, and the radio phone B receiving the call corresponds to FIG. **5**. It is natural that the method and system according to the invention can also be implemented in digital mobile telephone systems.

When the mobile station **501** has requested **502** call set-up from the mobile telephone system **503** with the message RQS, the mobile station **501** accepts only such a go-to-traffic-channel command GTC **504** that contains the identifier of the requested call, i.e. the identifier of the group call or call the mobile station **501** requesting the call has placed in its own request **502**. In case of an expanded group call, the prior art system only transmits a go-to-traffic-channel message wherein the identifier is the number **504** of the combined dispatching area. In such a case, all other mobile stations **505**, except the one **501** making the call, go to the channel assigned for the call. The calling mobile station **501** does not accept a go-to-channel command having a different identifier than the request **502**, and therefore the other mobile stations **505** go to the channel assigned for the call. This additional problem is solved according to the invention by transmitting, within the area of the expanded group call, a go-to-channel command GTC containing the identifier of the new call and, in the area of the base station of subscriber A, a separate additional go-to-channel command **506** having the identifier of the group the first mobile station **501** originally called to the group call. In this manner, all the desired phones will participate in the same call. It must be noted that the above-described go-to-channel commands containing the identifiers of the new group **504** and the called group **506** may also be transmitted in a different order.

FIG. **6** is a block diagram of the mobile communication system according to the invention. In the figure, mobile stations **M1**, **M2**, **M3** form a group call group **G1** and mobile stations **M4**, **M5**, **M6** form a group call group **G2**.

The figure shows a network infrastructure comprising one exchange MX, two base stations BS1, BS2 and the telecommunication connections **T1**, **T2** between them. The exchange MX comprises a group call database DB for maintaining data concerning group calls. It must be noted that the database may also be placed in some other part of the network infrastructure. The group call database according to the invention also comprises an expanded group call set-up table T.

The figures and the description related thereto are only intended to illustrate the inventive idea. The details of the mobile communication system and the method according to the invention for establishing an expanded group call in a mobile communication system may vary within the scope of the claims. Even though the invention is described above mainly in connection with trunked mobile communication systems, the invention can also be used in other kinds of mobile communication systems.

We claim:

**1**. A method for establishing an expanded group call in a mobile communication system which has a plurality of group call groups each formed of a plurality of mobile stations, and a network infrastructure which includes at least one exchange, a plurality of base stations, telecommunication connections between the at least one exchange and respective ones of said base stations, and a group call database for maintaining data concerning group calls, said method comprising the steps of:

activating an expanded group call set-up facility concerning a first said group call group in said group call database, the expanded group call set-up facility expanding a group call to concern at least one other said group call group, as an expanded group call to be established;

said network infrastructure receiving a group call set-up request concerning said first group call group;

said network infrastructure checking from said group call database whether an expanded group call set-up facility has been activated for said first group call group;

said network infrastructure noticing from said group call database that the expanded group call set-up facility has been activated for said first group call group;

said network infrastructure calling those of said mobile stations which form said first group call group, to said expanded group call to be established and said network infrastructure calling those of said mobile stations which form said at least one other group call group, to said expanded group call to be established; and

said network infrastructure establishing said expanded group call, by guiding those of said mobile stations which form said first group call group and those of said mobile stations which form said at least one other group call group all to communicate on one traffic channel each via a respective said base station servicing any said mobile station serving any said mobile station which is to participate in said expanded group call.

**2**. The method according to claim **1**, further comprising:

in connection with actuating said expanded group call set-up facility concerning said first group call group establishing, an expanded group call set-up table, in which table an identifier of said expanded group call group to be established is provided, which corresponds to an identifier of said first group call group.

**3**. The method according to claim **2**, wherein:

said calling of respective ones of said mobile stations to join said expanded group call to be established is performed by searching in said expanded group call set-up table for said identifier of said expanded group call group to be established corresponding to said identifier of the first group call group; and

said guiding includes, by transmitting a group call request containing said identifier of said expanded group call group to be established, said network infrastructure causing the respective said mobile stations to move to said one traffic channel, and thereby to said expanded group call, in response to receiving said identifier of said expanded group call group.

**4**. The method according to claim **3**, wherein:

said calling of the respective ones of said mobile stations to said expanded group call to be established is per-

formed in such a way that, in addition to said identifier of said expanded group call group corresponding to said identifier of said first group call group in said expanded group call set-up table being transmitted, said guiding including transmitting a group call set-up request provided with said identifier of said first group call group.

5. The method according to claim 1, further comprising:

in connection with activating said expanded group call set-up facility concerning said first group call group establishing an expanded group call set-up table, in which table identifiers of all other group call groups of said at least one other group call group the mobile stations of which are to be included in said expanded group call when said expanded group call is established, correspond to said identifier of said first group call group, whereupon when said network infrastructure has received said group call set-up request concerning said first group call group, said calling is practiced so as to call those of said mobile stations which form said first group call group and those of said mobile stations which form said other group call groups having identifiers corresponding to said identifier of said first group call group onto said one traffic channel, and thereby to said expanded group call.

6. The method according to claim 5, wherein:

said calling of respective ones of said mobile stations to join said expanded group call to be established is performed by transmitting to respective ones of said mobile stations, one after another, respective group call go-to-channel message containing identifiers of the respective ones of said group call groups corresponding to said identifier of said first group call group in said expanded group call set-up table, said network infrastructure thereby causing the respective said mobile stations of said first and respective other said group call groups to move onto said one traffic channel and to join said expanded group call in response to receiving said identifiers of the respective ones of said group call groups corresponding to said identifier of said group call group.

7. The method according to claim 5, wherein:

said calling of respective ones of said mobile stations to join said expanded group call to be established is performed by transmitting to respective ones of said mobile stations, at least one group call go-to-channel message, each containing said identifier of said first group call group, said network infrastructure thereby causing the respective said mobile stations of said first group call group to move onto said one traffic channel and to join said expanded group call in response to receiving the said identifier.

8. The method according to claim 6, wherein:

said calling of respective ones of said mobile stations to join said expanded group call to be established is performed by transmitting to respective ones of said mobile stations at least one group call go-to-channel message, each containing said identifier of said first group call group, said network infrastructure thereby causing the respective said mobile stations of said first group call group to move onto said one traffic channel and to join said expanded group call in response to receiving the respective said identifier.

9. A mobile communication system, comprising:

a plurality of mobile stations forming a plurality of group call groups;

a network infrastructure, comprising:

at least one exchange,

a plurality of base stations served by said at least one exchange,

telecommunication connections between said at least one exchange and respective ones of said base stations, and

a group call database for maintaining data concerning group calls;

an expanded group call set-up facility concerning a first group call group said group call database, said facility being arranged to be actuated for extending a group call to concern at least one other group call group, as an expanded group call to be established;

said network infrastructure being adapted to check, in response to receiving a group call set-up request concerning said first group call group, whether an expanded group call set-up facility has been activated for the first group call group, and if so, to call those of said mobile stations which form said first group call group and those of said mobile stations which form at least one other group call group, to the expanded group call to be established; and

said network infrastructure being adapted those of said mobile stations which form said first group call group and those of said mobile stations which form said at least one other group call group all to communicate on one traffic channel each via a respective said base station serving any said mobile station which is to participate in said expanded group call.

10. The mobile communication system according to claim 9, wherein: said group call database comprises an expanded group call set-up table wherein an identifier of said expanded group call group to be established corresponds to an identifier of said first group call group.

11. The mobile communication system according to claim 9, wherein:

said group call database comprises an expanded group call set-up table wherein identifiers of all other group call groups of said at least one group call group, the respective mobile stations forming which are to join said expanded group call, correspond to an identifier of said first group call group.

* * * * *

US006091956A

# United States Patent [19]

Hollenberg

[11] Patent Number: 6,091,956

[45] Date of Patent: Jul. 18, 2000

[54] **SITUATION INFORMATION SYSTEM**

[76] Inventor: **Dennis D. Hollenberg**, 364 Franklin La., Ventura, Calif. 93001

[21] Appl. No.: **08/873,965**

[22] Filed: **Jun. 12, 1997**

[51] **Int. Cl.**[7] ..... **H04Q 7/20**

[52] **U.S. Cl.** ..... **455/456**; 455/566; 455/557

[58] **Field of Search** ..... 455/432, 433, 455/435, 456, 556, 557, 558, 566, 12.1; 342/357, 454, 457; 340/825.47, 311.1, 905

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*Primary Examiner*—Nguyen Vo

*Assistant Examiner*—Sam Bhattacharya

[57] **ABSTRACT**

A wireless system for providing services and time-critical information about places and events to mobile computers and their users proximate to their current locations or potential destinations within enclosed areas, urban landscapes, and open areas, including travel distances and transit times, entertainment, merchants' messages, area attractions, communications, current locations of system users, and traffic congestion information and user-generated information from bar-coded objects and digital photographs of scenes and other materials. Included is a combination low-radiation dosage-reception handset for wireless communications which includes bar-code reader and digital camera peripheral devices for mobile computers, a bracket for interfacing a mobile computer with radio to external systems, and methods for improving the operations of computer reception, search, and display of such information for the edification, efficiency, and enjoyment of computer users.

**15 Claims, 9 Drawing Sheets**

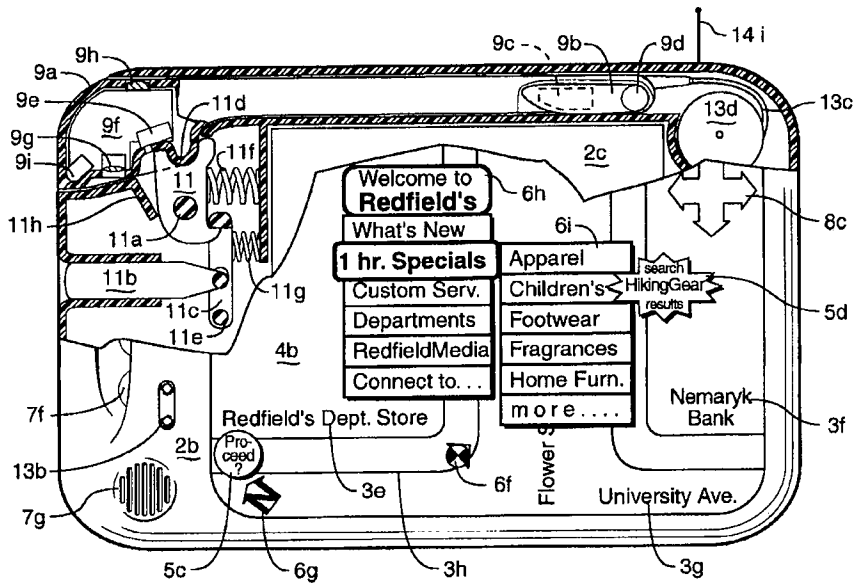
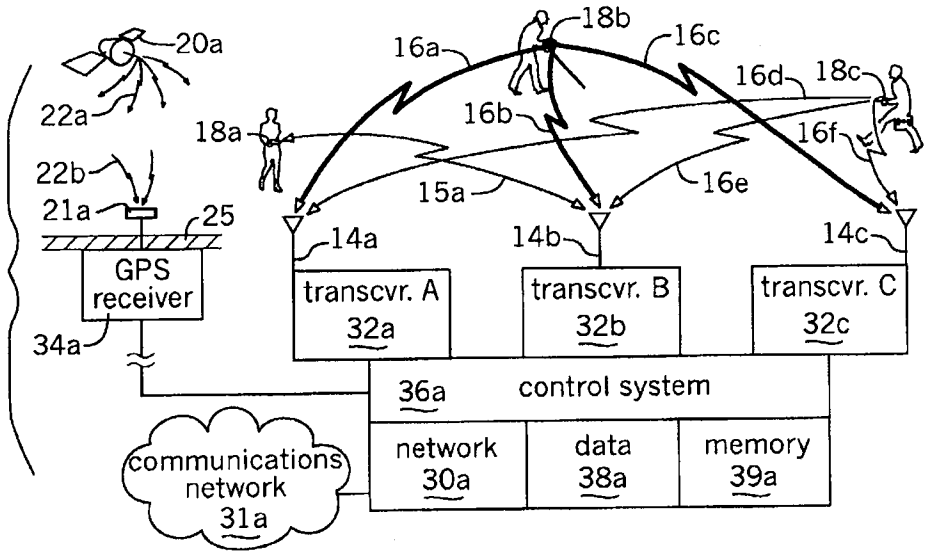


Fig. 1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22a
22b
21a
25
GPS receiver
34a
18a
16a
18b
16c
16d
18c
16b
16f
15a
16e
14a
14b
14c
transcvr. A 32a
transcvr. B 32b
transcvr. C 32c
36a control system
network 30a
data 38a
memory 39a
communications network 31a

Fig. 2

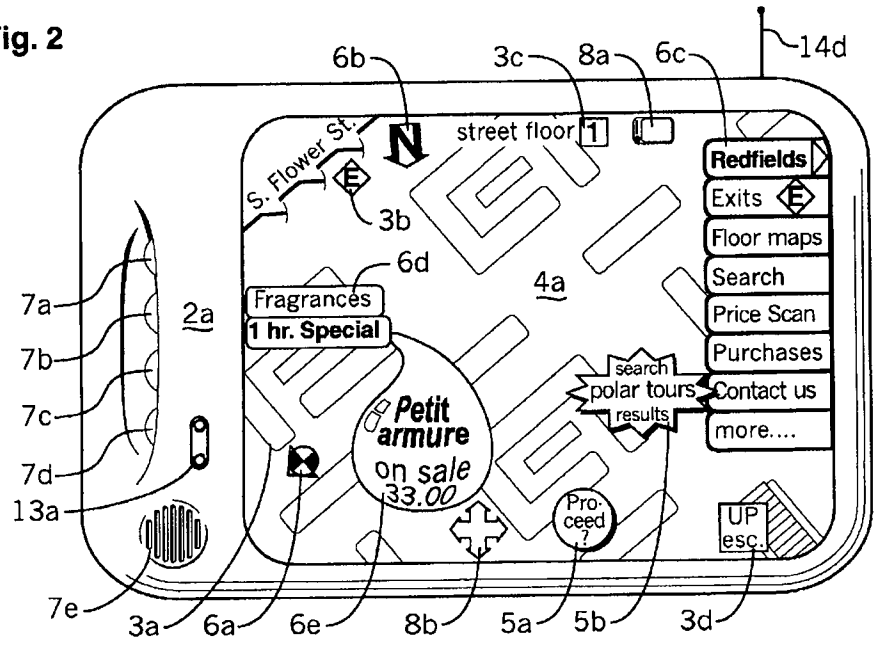
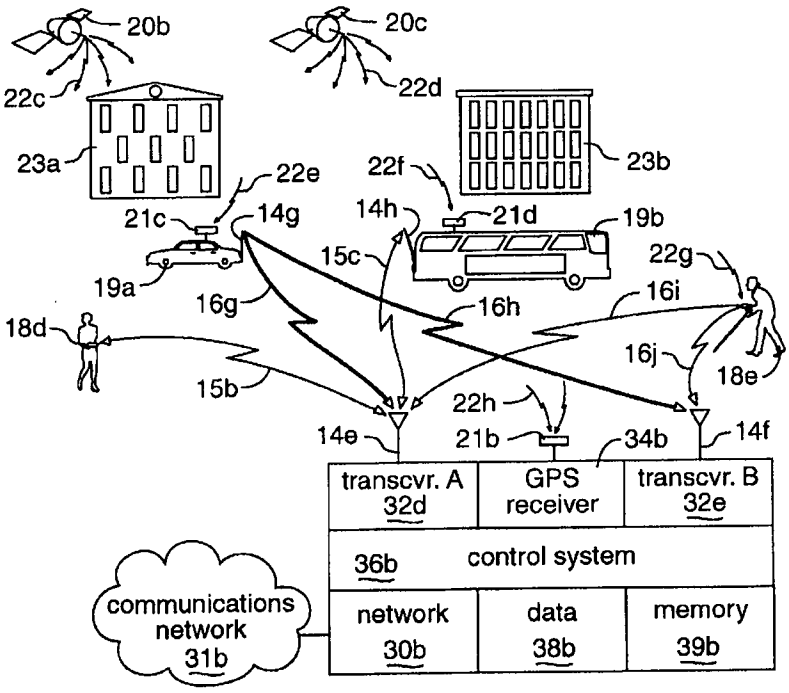

6b
3c
8a
6c
14d
street floor 1
S. Flower St.
N
E
3b
6d
4a
Redfields
Exits
Floor maps
Search
Price Scan
Purchases
Contact us
more....
Fragrances
1 hr. Special
2a
7a
7b
7c
7d
13a
search
polar tours
results
Petit armure
on sale
33.00
Pro-ceed
UP
esc.
7e
3a
6a
6e
8b
5a
5b
3d

Fig. 3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20c
22c
22d
23a
23b
22e
22f
21c
14g
14h
21d
19b
15c
22g
19a
16g
16h
16i
18d
16j
18e
15b
22h
14e
21b
34b
14f
transcvr. A 32d
GPS receiver
transcvr. B 32e
36b
control system
communications network 31b
network 30b
data 38b
memory 39b

Fig. 4

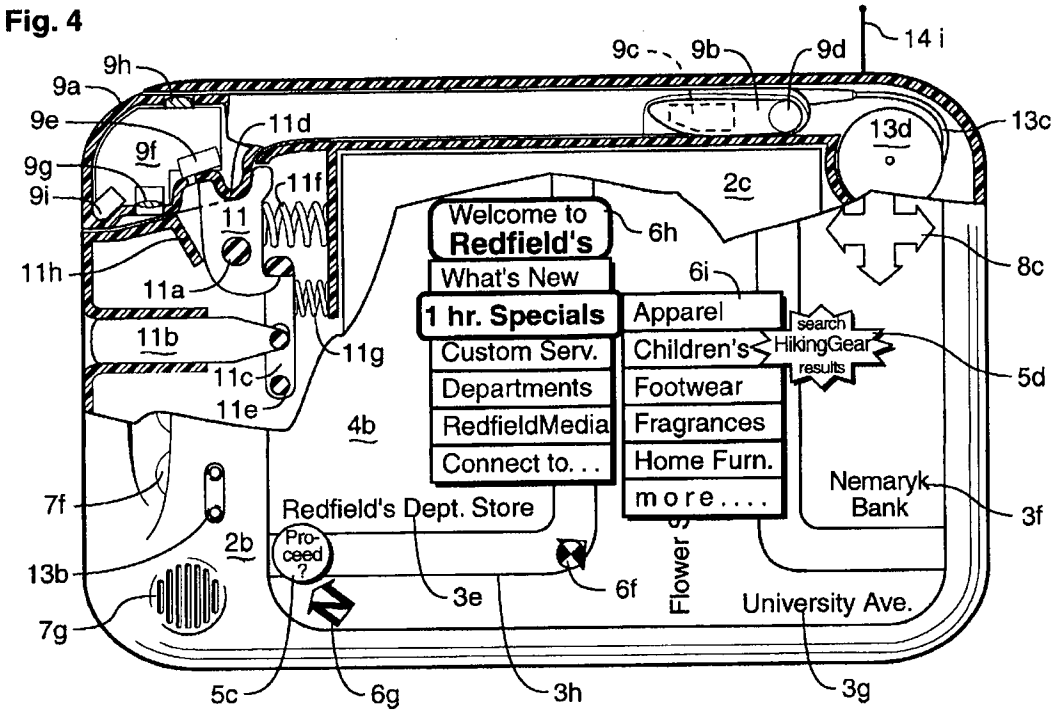

9h
9a
9e
9g
9i
11h
9f
11d
11f
11
11a
11b
11c
11e
11g
9c
9b
9d
14 i
13d
13c
2c
8c
Welcome to Redfield's
6h
What's New
1 hr. Specials
Custom Serv.
Departments
RedfieldMedia
Connect to. . .
6i
Apparel
Children's
Footwear
Fragrances
Home Furn.
more. . . .
search HikingGear results
5d
4b
Nemaryk Bank
3f
7f
2b
13b
7g
Redfield's Dept. Store
Pro-ceed ?
3e
6f
Flower
University Ave.
5c
6g
3h
3g

Fig. 5

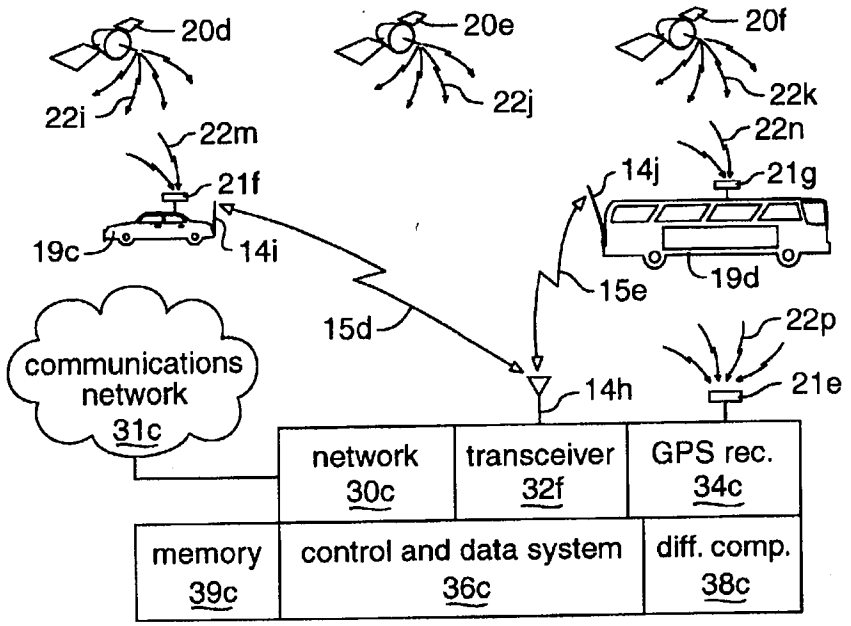

20d
20e
20f
22i
22j
22k
22m
22n
21f
14j
21g
19c
14i
15e
19d
15d
22p
communications network 31c
14h
21e
network 30c
transceiver 32f
GPS rec. 34c
memory 39c
control and data system 36c
diff. comp. 38c

Fig. 6

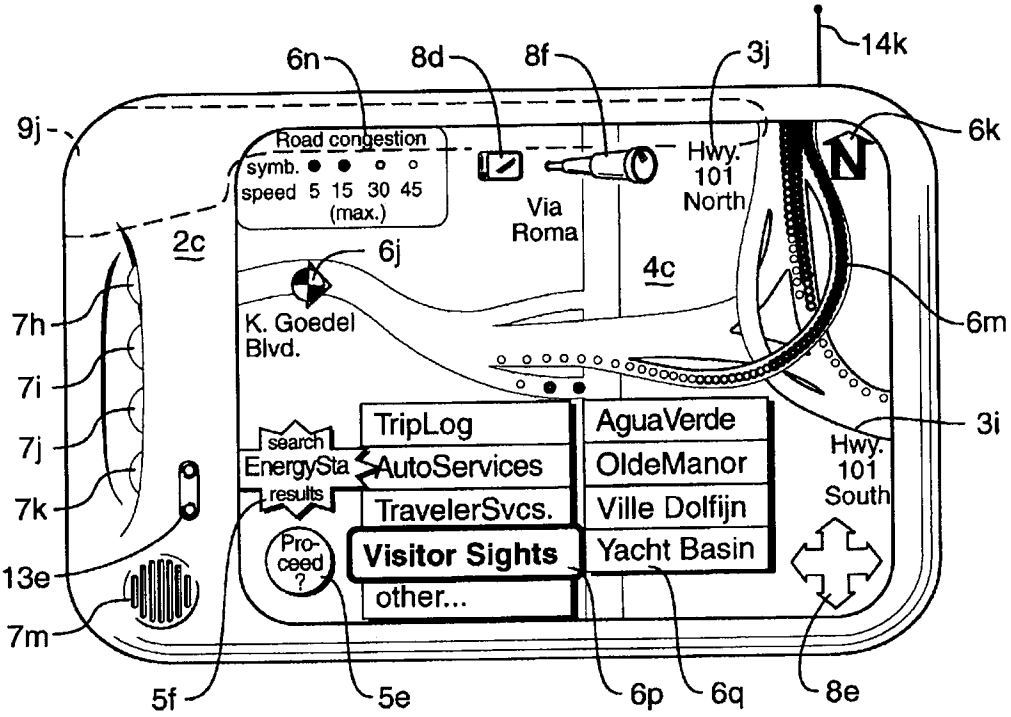

6n
8d
8f
3j
14k
9j
6k
Road congestion
symb. ● ● ○ ○
speed 5 15 30 45 (max.)
Via Roma
Hwy. 101 North
N
2c
6j
4c
7h
K. Goedel Blvd.
6m
7i
7j
TripLog
AguaVerde
3i
search
EnergySta
AutoServices
OldeManor
Hwy. 101 South
7k
results
TravelerSvcs.
Ville Dolfijn
Pro-ceed ?
Visitor Sights
Yacht Basin
13e
other...
7m
5f
5e
6p
6q
8e

Fig. 7

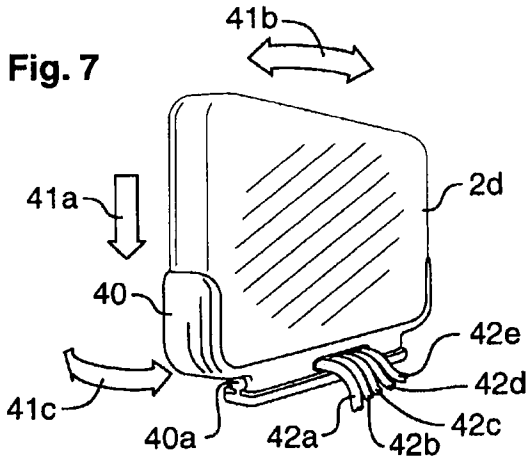



Fig. 8

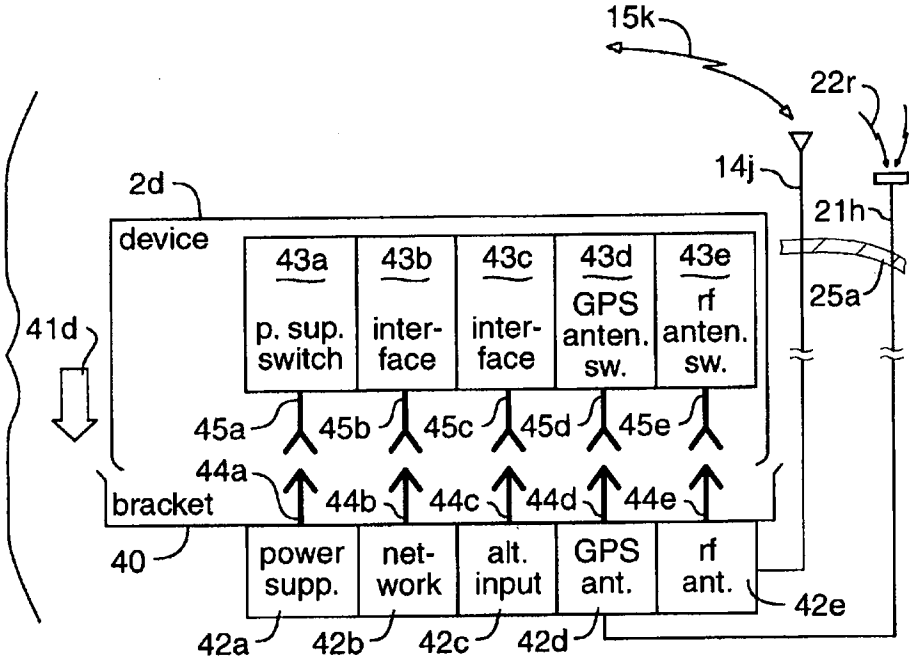



Fig. 9

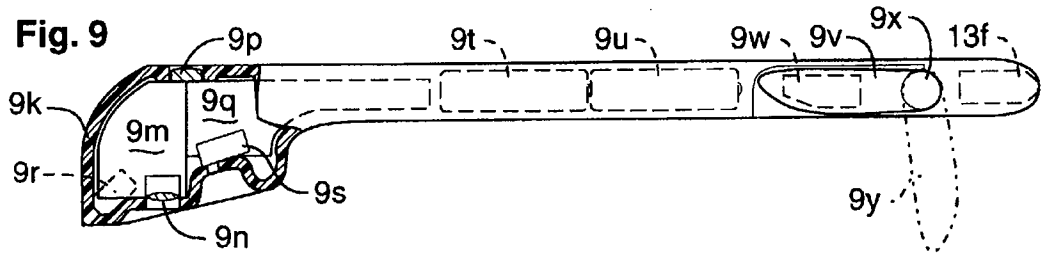


Fig. 10

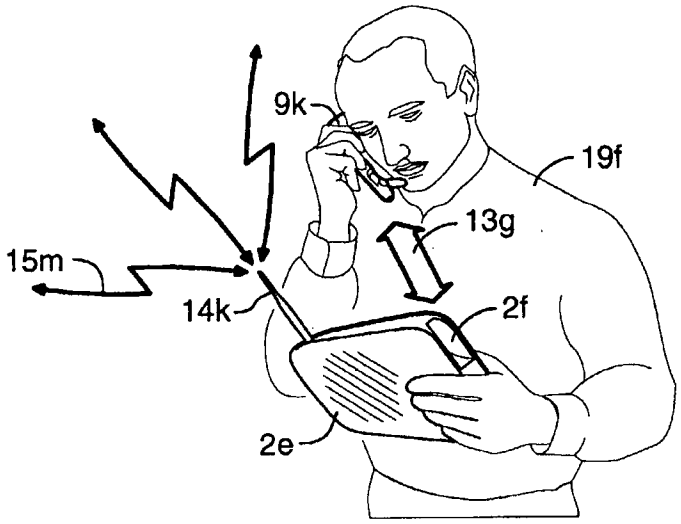



Fig. 11

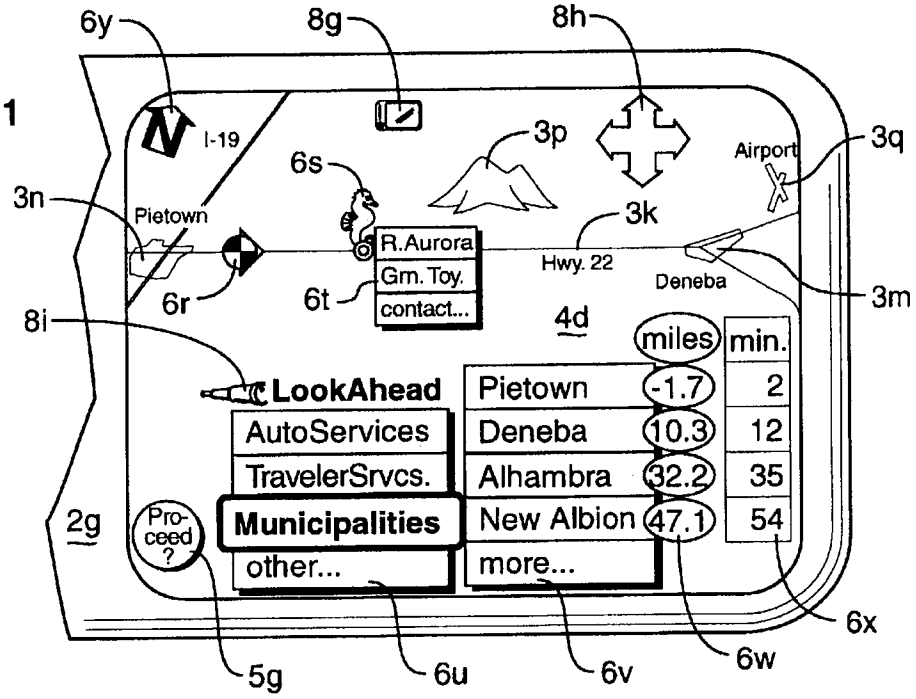



Fig. 12

29 →

| item ref. 29a | identifier 29b | location 29c | data type 29d |
|---|---|---|---|

FIG. 13

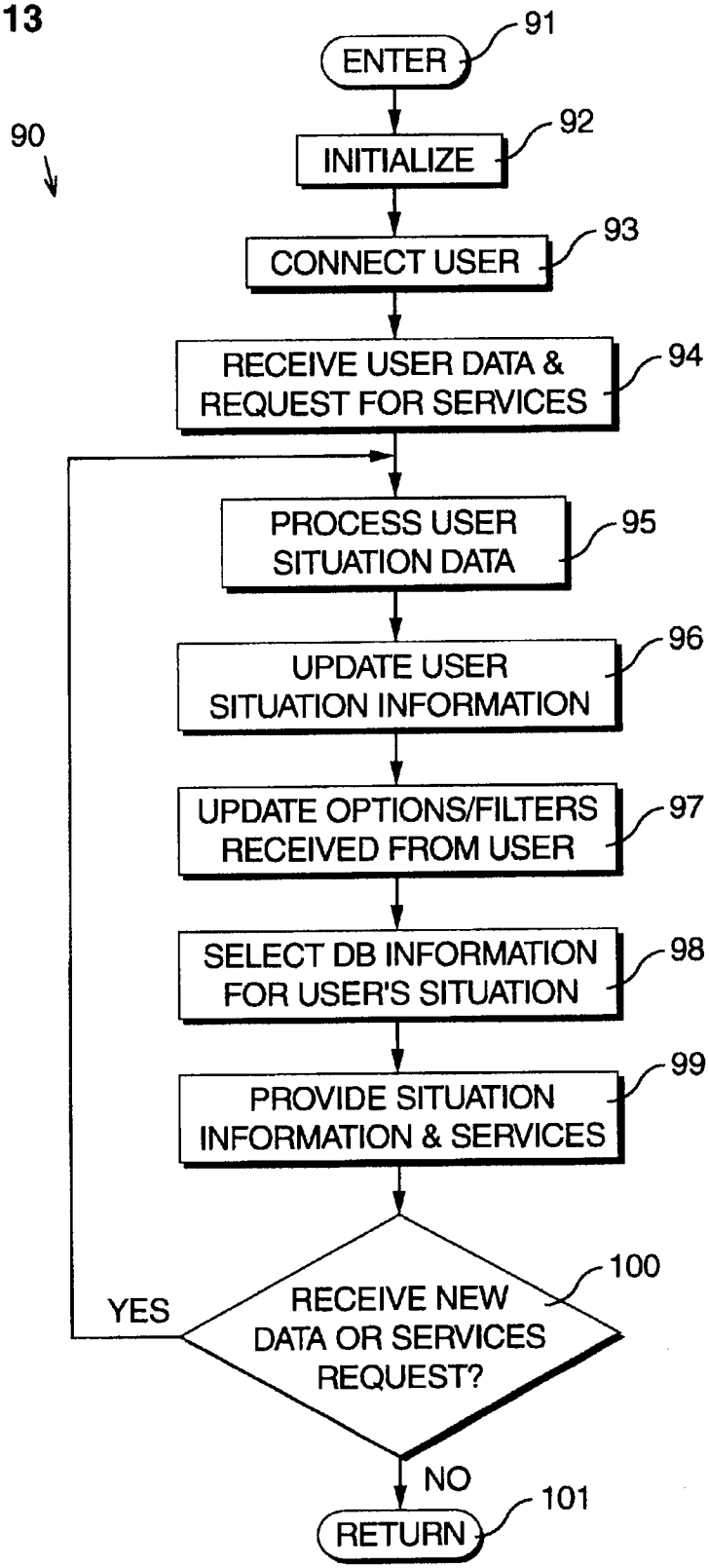

90
ENTER
91
INITIALIZE
92
CONNECT USER
93
RECEIVE USER DATA & REQUEST FOR SERVICES
94
PROCESS USER SITUATION DATA
95
UPDATE USER SITUATION INFORMATION
96
UPDATE OPTIONS/FILTERS RECEIVED FROM USER
97
SELECT DB INFORMATION FOR USER'S SITUATION
98
PROVIDE SITUATION INFORMATION & SERVICES
99
RECEIVE NEW DATA OR SERVICES REQUEST?
100
YES
NO
RETURN
101

FIG. 14

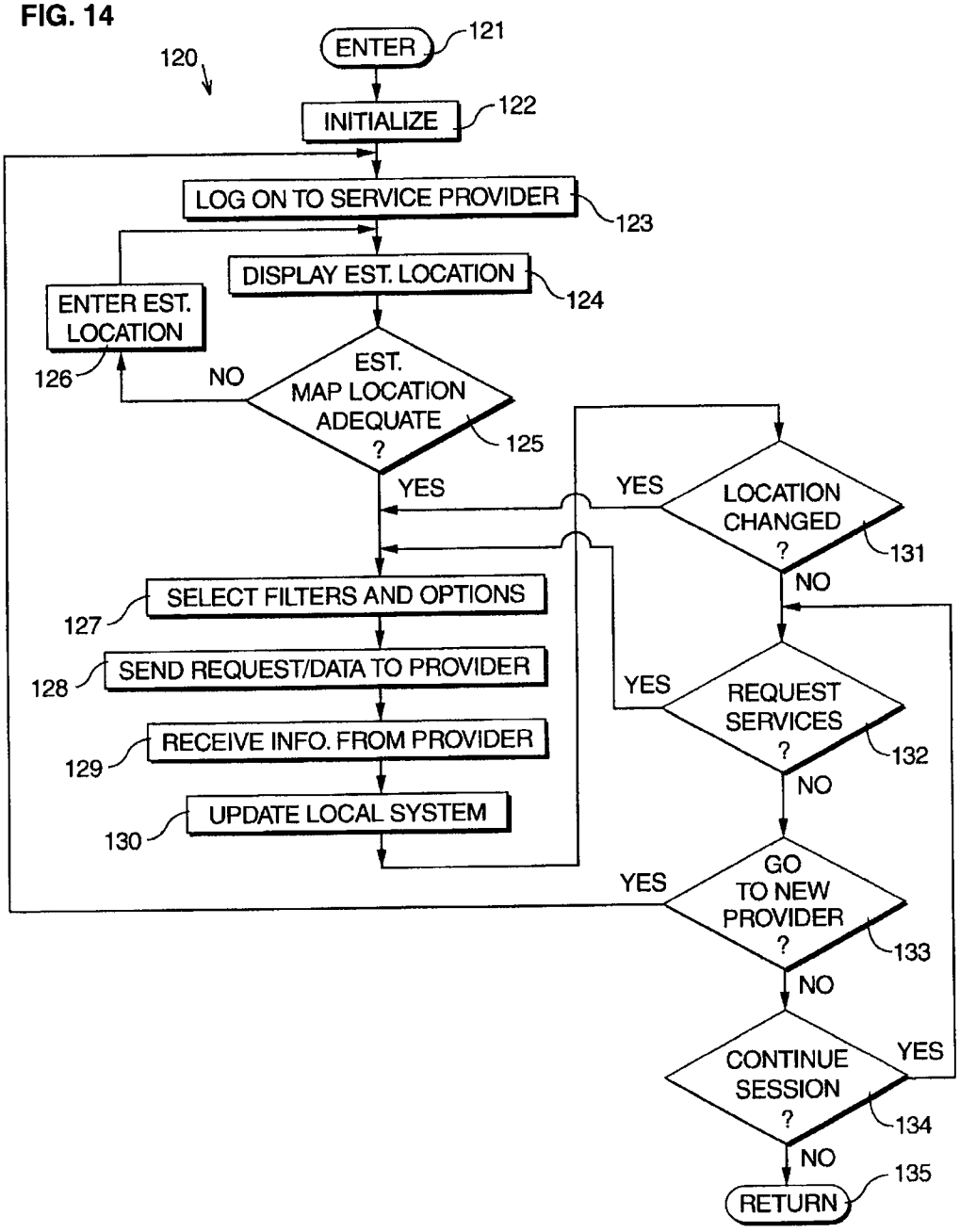

120
ENTER
121
INITIALIZE
122
LOG ON TO SERVICE PROVIDER
123
DISPLAY EST. LOCATION
124
ENTER EST. LOCATION
126
NO
EST. MAP LOCATION ADEQUATE ?
125
YES
YES
LOCATION CHANGED ?
131
NO
SELECT FILTERS AND OPTIONS
127
SEND REQUEST/DATA TO PROVIDER
128
RECEIVE INFO. FROM PROVIDER
129
UPDATE LOCAL SYSTEM
130
YES
REQUEST SERVICES ?
132
NO
YES
GO TO NEW PROVIDER ?
133
NO
CONTINUE SESSION ?
YES
134
NO
RETURN
135

FIG. 15

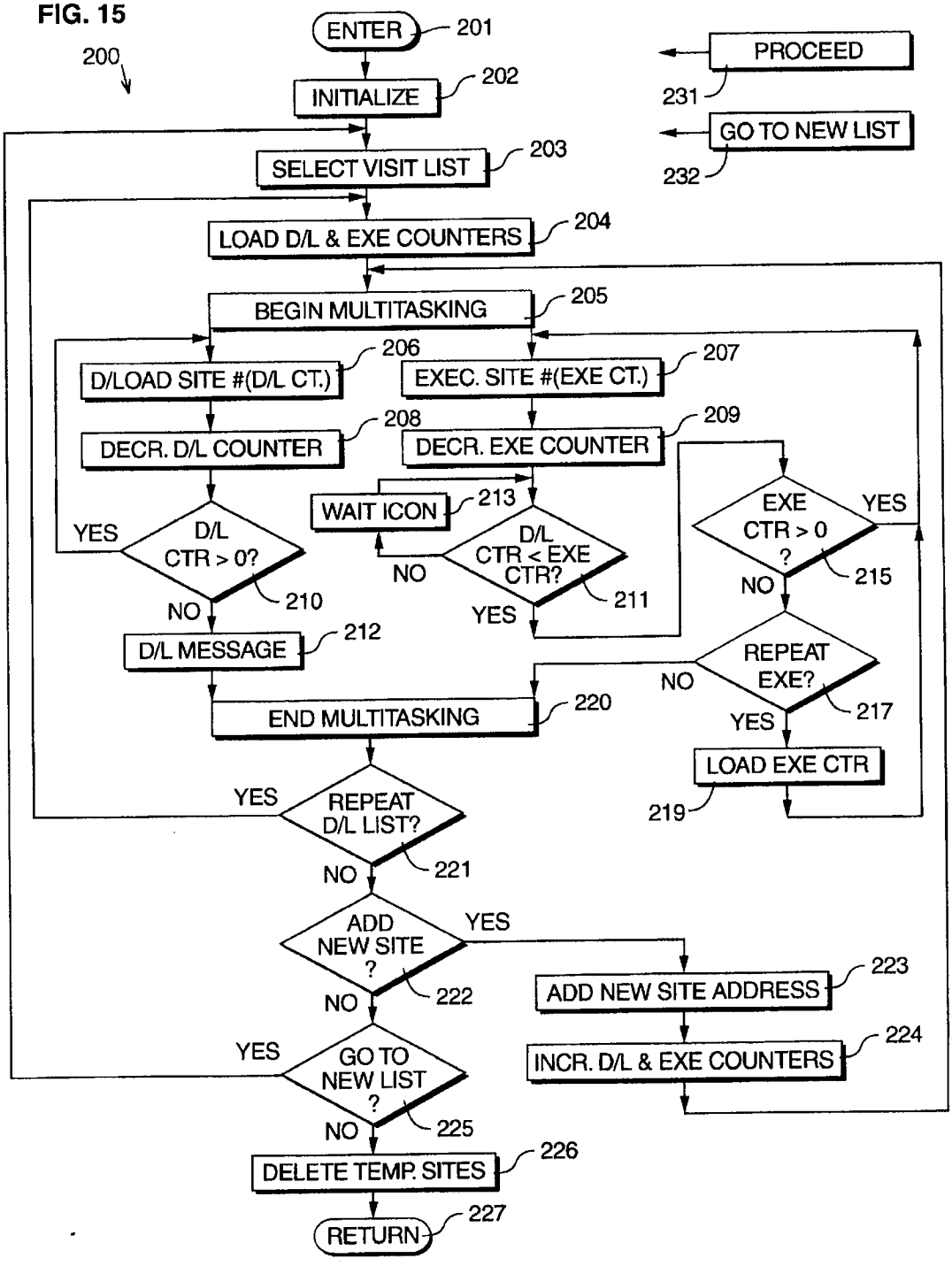
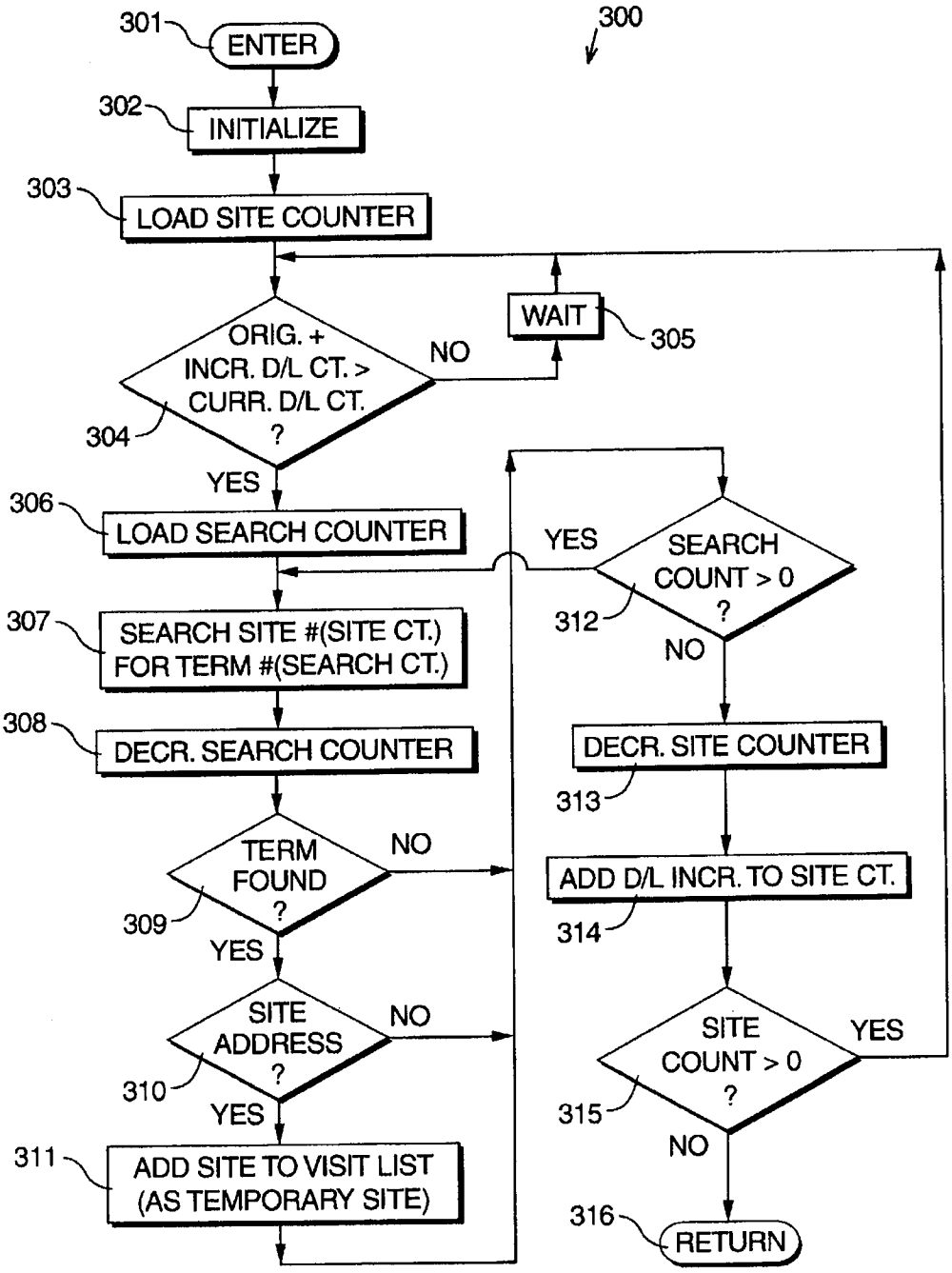

200
ENTER
201
INITIALIZE
202
SELECT VISIT LIST
203
LOAD D/L & EXE COUNTERS
204
BEGIN MULTITASKING
205
D/LOAD SITE #(D/L CT.)
206
EXEC. SITE #(EXE CT.)
207
DECR. D/L COUNTER
208
DECR. EXE COUNTER
209
WAIT ICON
213
YES
D/L CTR > 0?
210
NO
D/L MESSAGE
212
NO
D/L CTR < EXE CTR?
211
YES
EXE CTR > 0 ?
YES
215
NO
REPEAT EXE?
217
YES
LOAD EXE CTR
219
NO
END MULTITASKING
220
YES
REPEAT D/L LIST?
221
NO
ADD NEW SITE ?
YES
222
ADD NEW SITE ADDRESS
223
INCR. D/L & EXE COUNTERS
224
NO
GO TO NEW LIST ?
YES
225
NO
DELETE TEMP. SITES
226
RETURN
227
PROCEED
231
GO TO NEW LIST
232

FIG. 16


300
301
ENTER
302
INITIALIZE
303
LOAD SITE COUNTER
ORIG. + INCR. D/L CT. > CURR. D/L CT. ?
304
NO
WAIT
305
YES
306
LOAD SEARCH COUNTER
307
SEARCH SITE #(SITE CT.) FOR TERM #(SEARCH CT.)
308
DECR. SEARCH COUNTER
TERM FOUND ?
309
NO
YES
SITE ADDRESS ?
310
NO
YES
311
ADD SITE TO VISIT LIST (AS TEMPORARY SITE)
YES
SEARCH COUNT > 0 ?
312
NO
DECR. SITE COUNTER
313
ADD D/L INCR. TO SITE CT.
314
SITE COUNT > 0 ?
315
YES
NO
316
RETURN

# SITUATION INFORMATION SYSTEM

## BACKGROUND—FIELD OF INVENTION

This invention relates to distributed information systems, specifically those which exchange information about places, their events, and details with mobile computers and their users.

## BACKGROUND—GENERAL DISCUSSION

Societal changes, marked by increasingly mobile life styles, greater work demands, and downsizing in business and government, have desocialized public environments by reducing people's free time. A consequence is that the lively marketplace atmosphere that once inspirited our city centers has generally been replaced by inhospitable spaces. For example, in cities only at lunch times do people fill the few open urban spaces to socialize and find diversion before returning to work. Most people in our increasingly connected society require communications access in order to conduct their daily business, access generally unavailable outside of buildings.

Environments providing accessible data communications resources would attract such people regularly since they could continue working on their projects. The presence of these workers would draw other visitors, some of whom might offer products or services or visit because of the interesting assortment of people reliably to be found there. Thus, after providing the seeding effect of appropriate communications services, modern-day marketplaces could again enliven our cities and towns. Such environments would provide a true sense of physical place which the Internet lacks. Businesses, potentially the best providers of such services, can't support them without payback, however.

While people's need for information that specifically fits their needs has increased, the availability, accessibility, and timeliness of this information, about specific places, events, and their details, called situations herein, have decreased. The current population is aging but, at the same time, continues to travel more than those of the past. Everyone, particularly senior citizens, need ready information concerning events, conditions, and services about a place, particularly when it's unfamiliar or one which they are about to visit, to be more secure and better able to enjoy it.

Similarly, people with physical challenges could function more freely in public places with the aid of a system which provided them with a specifically appropriate combination of aural, visual, and tactile information about their location. Having ready access to timely, proximate information, i.e., information particularly relevant to a user's location such as local services information, such as transportation-system routes and schedules identifying nearby stops and other services, would increase their traveling efficiency and safety.

Because people now have less time, shopping is taking a greater proportion of free time. Worsening the problem, many stores are cutting costs by reducing staffing and merchandise inventories. Shoppers searching for price or stock information in a store must now spend more time searching the isles for help in finding the merchandise they seek. Clearly, useful time-critical and specific information about stores' offerings—merchandise information—is increasingly out of reach.

With Internet (via the PC) and TV information competing for audiences, local retail stores increasingly find it expensive and difficult to advertise their inventories to their desired audiences. A system that leads the customer directly to the offered merchandise, occasionally calling the customer's attention to related or promoted items, would increase that store's sales volume.



In contrast to the diminishing availability of local information, world-wide information via the Internet is burgeoning. While users of the World-wide Web can get information about a specific product in a distant country, information about price and availability of a product at a local store is often frustratingly difficult to get. Once the product is located, the final shopping penalty is the time wasted in the cashier's line.

A partial solution to these problems is the ubiquitous portable telephone. However, the expense for using it for frequent inquiries about services and products would quickly grow exorbitant. An obvious problem, too, is the lack of an accessible and efficient telephone directory or database to quickly connect to the appropriate information source. Product pricing information often requires a bar-code reader, i.e., a device for scanning the bar code, or universal product code (UPC), of a product, which is only available at the cashier's station. Too often such attempts to gain information results in wasted time.

Another problem with portable telephones is their potential for insidiously causing cancer in sensitive organs such as the brain. Because the radio frequency (rf) transmitter and antenna of the wireless telephone is the source of potentially cancer-causing electromagnetic wave radiation (EMWR) and is positioned near the head when the user telephones, the head area receives the highest radiation dose. An additional potential health hazard of such telephones is their suspected interference with cardiac pacemakers.

Lack of timely information about traffic congestion each year can cumulatively amount to several days taken from commuters' lives, as much as two weeks worth of eight-hour days in the largest cities, and, with fewer new highways under construction, the losses can be expected to rise. With better and more timely information about traffic, which includes aircraft, watercraft, etc., some traffic jams could be avoided. However, even after years of existence of the Intelligent Vehicle Highway System initiative, little improvement has been forthcoming. Currently, generally available traffic advisory information is limited to the airborne radio report which only functions after a traffic slowdown happens to be spotted. Any solution to this problem must be cheap, simple, and ubiquitous.

Timely and reproducible information about situations involving criminal acts would serve to reduce their numbers by deterring the perpetrators. For example, if cameras were commonly carried by people, the probability of perpetrators being photographed and identified increases. A digital camera built in to a portable computer device or telephone could share some of the circuitry to reduce the marginal cost of adding it. Such a camera could also serve to record travel scenes, copy documents, and, for the solution to be widely embraced, provide entertainment for users.

Information about places and their events, situation information, helps people to function closer to their potential. Such information resides available, but largely inaccessible because it lies unindexed and distributed in a plethora of largely local repositories. The lack of access to situation information is largely a technological problem the solution for which includes elements of business, the Internet, entertainment, communications, and computer technology. In order for a solution to be workable and universally embraced, it must also be distributed, put into the hands of average people.

## BACKGROUND—DISCUSSION OF PRIOR ART

Finding the location of radios, including transmitters and transponders, through various methods including chronometrical, i.e., time measuring, triangulation is well understood. The U.S. Global Positioning by Satellite (GPS) System and the Russian Global Navigation Satellite System (GLONASS), collectively referred to herein as the satellite positioning system or GPS, are comparatively recent permutations of these methods which provide precise time signals for mobile receivers to compute their location. GPS signals are often obscured in environments of hills or tall buildings.

Methods of using rf signals from various sources for location finding are well known. McEwen U.S. Pat. No. 5,589,838 (1996) shows a mobile transmitter emitting pulse groups which are then triangulated by multiple stationary, self-gating pulsing receivers; the receivers must process large data sets in order to resolve each transmitter's location. Jandrell U.S. Pat. No. 5,526,357 (1996) shows a multilaterating communications system using mobile transponders for intercommunication and locating. Duffet-Smith U.S. Pat. No. 5,045,861 (1991) shows a method of determining the location of a roving receiver by way of computing the phase difference of multiple signals from multiple transmitters.

Methods using combinations of satellite and wireless communications for fleet operations include Barzegar et al. U.S. Pat. No. 5,559,520 (1996) which shows a vehicle routing system with GPS and an on-board locator control module with storage which provides modifiable route information, received data with location markers (which term, markers, is neither clear nor defined) and alarms to alert a central dispatcher of deviation from an defined, assigned route. Similarly, Schreder U.S. Pat. No. 5,504,482 (1996) shows a GPS navigation system with complex on-board digital map storage, interfaces to vehicle control systems, route processing to destination, etc. Paul U.S. Pat. No. 5,524,081 (1996) shows a system of GPS-signal-receiving vehicles with preloaded golf-course information and a base station which provides differential location correction and information specific to the vehicle's location on a golf course. However, with thousands of mobile transmitters, such as motor vehicles on crowded freeways, or widely ranging systems traveling to diverse destinations, the forementioned prior art would require unworkably large, difficult to update, on-board locator data modules or data bases. Such systems would suffer from the centralized nature of their information sources and would therefore be subject to complex data processing and data updating burdens which no ordinary user could perform as the logistics would be unworkable.

Other location-related prior art includes Penny, Jr. et al. U.S. Pat. No. 5,414,432 (1995) showing a locating transceiver with GPS optionally included in a portable radio which transmits a rescue message. Simms et al. U.S. Pat. No. 5,334,974 (1994) shows a mobile security system which transmits position information to a central console map and dispatcher for providing emergency service. Finally, Krenzel U.S. Pat. No. 5,124,915 (1992) shows a dedicated emergency information gathering system which provides information to a central analysis location. Such prior art systems address infrequent events as opposed to the need for continuing information flow in many people's daily lives.

Prior art addressing vehicle traffic congestion and navigation includes Sone U.S. Pat. No. 5,313,200 (1994) showing a centralized traffic congestion display system with directional arrows to indicate the location and direction of travel of the congested traffic. Sumner U.S. Pat. No. 5,182,555 (1993) and Sumner U.S. Pat. No. 5,173,691 (1992) show a messaging system and data fusion system, respectively, for an elaborate, centralized traffic congestion information system. Such systems, with their centralized information processing systems, prove expensive to build and maintain and are prone to failure. Barbiaux et al. U.S. Pat. No. 4,804,937 (1989) shows a wireless vehicle monitoring system for fleet operations which provides vehicle operational data to a central database.

Prior art relating to further aspects of subject invention include Montague et al. U.S. Pat. No. 5,504,589 (1996) showing a wireless ordering system for food service applications; Register U.S. Pat. No. 5,465,038 (1995) showing a recharging and data-transfer docking bracket which accepts a handheld computer; Hanson U.S. Pat. No. 5,218,188 (1993) shows a handheld data terminal with the capability to link with an rf communications computer; Kelly et al. U.S. Pat. No. 5,184,314 (1993) showing a mobile data communications terminal with docking bracket for an external antenna and keyboard interface to accept a handheld computer with rf communications capability; Davis U.S. Pat. No. 5,052,943 (1991) showing a recharging and data transfer bracket for receiving an elongate handheld computer; and Girouard et al. U.S. Pat. No. 4,982,346 (1991) which shows a fixed-location kiosk for retail-mall promotion applications. While the subject matter of the latter six prior-art exhibits pertain to aspects of subject invention, none provide the handheld computer and communications characteristics that a time and place-critical information system demands.

## SUMMARY OF THE INVENTION

The Situation Information System relates to information communications between sources of timely information and one or more information users which also provide information to other users. Broadly stated, situation information pertains to information about events or conditions associated with places which the mobile user may encounter or consider visiting. It particularly includes events occurring or about to occur in a locus accessible to the mobile user and to which the user may arbitrarily choose to respond by visiting one or more of the events, avoiding them entirely, communicating them to another person, rectifying them, or otherwise modifying plans and itineraries in light of such events. Sources of situation information are databases of local information and information from users themselves. Additionally, the situation information system provides users with up-to-date map-tracking information relating their location to events and situations as well as enabling them to respond in a timely manner.

A comparatively simple area-data communications system operates using high frequencies at sufficiently low power levels to avoid interference with neighboring systems. For example, in substantially enclosed areas a system consisting of multiple transceivers transmit a query signal to mobile transponder devices included in handheld personal computing devices. When the transponder responds with its identification sequence, its location is then computed through chronometric triangulation based upon transponder signal arrival times at the system receivers.

In cities having "urban canyons" formed by tall, close buildings, Global Positioning System (GPS), meaning the global satellite positioning system such as GPS, GLONASS, or other systems, signals are further degraded by multiple-path interference and signal-acquisition failure. In such an environment transponders and receivers could use the rf

signal from a satellite positioning system as a timing signal as the source of a gating pulse or trigger to coordinate their functions. In this mode, upon receipt of the satellite clocking signal, the transponder transmits its signal while, at the same instant, local receivers begin counting in order to quantify the elapsed time preceding their receipt of the transponder signal emitted by the device. Thus, device and transponder location is then calculated chronometrically from the elapsed time, net of internal device delays, etc., at each of multiple triangulating receivers. In these location-finding systems, position resolution to within a few feet is possible in an otherwise obscuring topography.

In the preferred embodiment, a situation information system consists of at least one mobile computer with multiple transmitters and receivers, i.e., radios, a known-location information service provider including one or more radios, accessible network, computer equipment with memory, which term includes storage, drives, and RAM units, and computer programs to provide for efficient situation information exchange between them. The mobile computer's transmitters and receivers include a receiver for satellite positioning system signals, such as GPS or GLONASS, a transceiver for wireless voice and data telecommunications capability, and a transponding transceiver for location finding in topographically complex, that is, mountainous areas or areas surrounded by buildings, e.g., in urban "canyons" and those enclosed within buildings, such as shopping malls.

These radios can be produced in the form of multiple frequency radios to reduce cost and size, by requiring only a single set of components, and function as many different radios depending upon their operating parameters. Alternatively, increasing capacities of the digital signal processor (DSP), currently lead by a chip capable of performing up to 1,600 million instructions per second, augurs the coming of so-called software radios in which virtually all rf processing functions will be performed in solid-state devices such as silicon-on-insulator (SOI) methods. In the next few years wireless telephones with software transceivers appearing on the market will offer selectable protocols and frequencies for GSM, CDMA, PCS, etc. Smart antennas will continue to improve and provide greater selective directionality to further enhance the efficient use of rf spectrum, which, along with the advantages of digital communications, promises to provide an abundance of channel capacity.

One such transceiver of subject invention provides voice communications which, because it is desirable that the form factor of the situation information device provide a usefully large display or graphical display unit (GDU), which term includes all forms of sensory media such as tactile and aural as well as visual, and militates against an integral telephone ear piece or telephone speaker and a telephone mouth piece or telephone microphone, separate the foregoing parts from the rf processing section in the form of a separate handset. The handset, removably stored in or upon the case of the situation information device, contains the aforementioned speaker and microphone components and is connected to the rf section by an extendible cord attached to a reel. The handset may alternately communicate to the radio section of the situation information device by way of a photonic link, which includes an infrared (IR) media link, providing the microphone and speaker signals are appropriately converted by analog-digital and digital-analog techniques, respectively.

Although the small form factor customary of mobile telephones is sacrificed in the aforementioned arrangement, other benefits accrue to users of subject invention. First, because the handset is physically removed from the rf antenna of situation information device when in use, rf or EMW radiation to the head is reduced considerably. By holding the combination display unit and radiative transmitter and antenna away from the body—at arm's length, if convenient—harmful radiation exposure is reduced by at least two orders of magnitude. Radiation intensity varies in inverse proportion to the square of the factor of difference in the distance. Thus, by moving the rf transmitting antenna from about two inches from the brain, as it is in integrated-unit mobile telephones, to twenty inches away, radiation exposure to the organ is reduced to a mere one per cent of the original intensity.

Secondly, to increase the situation information capability of the system, peripheral devices such as a bar-code reader and a digital camera, which term, peripheral devices, also includes keyboards, printers, and other input/output equipment. The digital camera, because of the decreasing size of its components, for example, the lens and the resulting tiny aperture, can serve to copy documents and can be fit into the handset. In such a configuration, these peripheral devices can share electronic components such as computer central processing unit, DSP unit, memory, storage, and rf units, as appropriate, to avoid cost and space requirements of their duplication. Included also is a wireless, meaning all photonic media such as infrared, data interface for wirelessly connecting to peripheral devices, including the aforementioned handset, or suitably equipped computers such as the desktop personal computer (PC).

Subject invention would prove useful to, for example, visitors driving into an unfamiliar city. They would want to know about hotel accommodations and restaurant offerings in the city as they approached it. While reviewing the hotel situation information, for example, their electronic map would show traffic congestion forming in their path and they may choose to take a more immediate exit in order to avoid congestion. They would review hotels having vacancies and special offers in their price range and negotiate reservations by telephone or electronic mail (e-mail). Additionally, the visitors could arrange their stay's agenda by reviewing the area's attractions and entertainment offerings while homing in on their chosen hotel using the digital map which would show their position relative to their goal. As they approached their hotel, the map display would zoom in to reveal increasing detail, ultimately positioning them at the hotel's entrance. Upon their arrival and because the staff, using their hotel computer, would be able to monitor the visitors' progress, the visitors could be greeted by name.

Removed from its bracket mounted inside their automobile, the visitors could carry their situation information device with them as they explore the city on foot and use it to learn about the city as they approach historical sites and attractions. While visiting a department store, one visitor could take a digital photograph of the other modeling a potential clothing purchase using the camera built into their situation information device. The trial fitting and photographing might continue at other stores so that the fit of the clothes from different stores can be viewed on the display and compared later. Next they might visit an attraction in the area such as a zoo or wildlife preserve and use the bar-code reader built into their situation information device to search and receive additional information about plants, animals, environments, and histories of specimens they encounter. Similarly, they could enter and record the organisms' names and natural histories into their device as they photograph them.

The same visitors the following day at the department store could use their situation information device to search the store's gift suggestions to choose presents to give to their grandchildren upon their return home. Their indicated position, which is conveniently tracked for them on the store's floor plan shown on their display, would speed them on their way to the various items they've selected for viewing. The bar codes of those items selected could then be scanned into their device, as well as that of the chosen clothing article, and, with their charge-card information transmitted automatically to the store's system and verified, the transaction could be completed with dispatch.

Such a system, which allows the store to provide its information and message to potential customers who are opportunely traveling nearby, stands a better chance of enticing them to visit: getting a customer who is driving along a nearby street into the store is easier than motivating him or her to leave home or work, get in the car, endure traffic, find parking, etc.

Further, a networked store could benefit by directing employees' activities to more profitable tasks like providing better customer service, for example. Extending the idea further, a customer possessing a device with a communication link to information from the store's product database, a terminal device for querying the database, and a bar-code reader, could shop for merchandise without the assistance of store personnel. With appropriate prior credit arrangements, the shopper could collect and price his or her merchandise, electronically execute the charge instrument for the purchased items, and exit.

In such a scenario, a local extranet and customer-carried display device could provide a new type of promotion and advertising medium. For example, knowing a person's location, the networked store could increase customer traffic by transmitting special offers directly to the willing customer's device. An additional benefit is that customers can receive services like maps and other aids to help them find their way around the store or shopping mall to the desired merchandise or store, respectively.

Situation information devices could also provide additional digital information services such as electronic mail, entertainment, games, news, television, particularly digital TV, and access to other networks, including the Internet, for example. The requisite services could also be provided by a store, a restaurant, or a shopping district association to promote a steady clientele.

Subject invention also a provides a resource for foreign or physically impaired visitors who lose their way in an area without situation information services is a device with which they could transmit a digital photograph of their location to local authorities who, after identifying their location, could orient them. Alternatively, the posts of street signs could carry an appropriately located bar code label which, when scanned with a bar-code reader, would instantly reveal the reader's location and the names of nearby streets, etc. A mobile computer and wireless telephone with peripheral devices built-in, such as a telephone handset, a digital camera, and a bar-code reader would enhance visitors' exploration and enjoyment of an area.

With camera and bar-code reader combined with the telephone handset, users would require a single element to perform all three functions. Also, many of the same electronic components could provide function to each of the peripheral devices, for example, the digital computer could provide much of the digital processing for the peripheral devices. The housing of a usefully large display could also provide convenient attachment for the removable telephone handset with integral camera and bar-code reader. Further, the radio transmitter section of the wireless telephone could be separated and located within the display section; the transmitter would then communicate with the handset through retractable wire or a wireless link such as infrared.

Area services and public safety personnel could do their jobs faster and more effectively with a ready source of situation information at their fingertips. For example, traffic congestion and emergency-situation information can be provided to approaching motorists and distant emergency decision makers, respectively, by those on the scene equipped with camera and communication capabilities. Digital photographs or video recordings of the scene could be quickly transmitted to those who evaluate emergency-situation information. In the case of vehicular traffic congestion, the vehicle's location, speed, and travel-direction data could be collected and redistributed as real-time, graphical, traffic-situation information. Thus, vehicle operators could avoid traffic situations that lay in their paths. Motorists encountering accidents could transmit digital photographs to the emergency-response dispatch center. Accident victims could also record traffic-accident details, drivers involved, drivers' identification, license-plate numbers, etc., as corroborating visual information.

In yet another embodiment of subject invention the situation information device would connect to external systems, that is, systems which are substantially external to the situation information device, such as electrical power from the vehicle's electrical system, exterior antennas, vehicle digital network, and other peripheral devices like a keyboard. For example, after driving to the shopping area users connect to peripheral devices enabling them to send and receive e-mail, print files, etc.

In yet another embodiment of subject invention is a distributed system of information service providers which provide data about geographical features, services, and attractions in their local area and transmit that data to mobile devices for display. Data such as mileage to various municipalities, services, and attractions using a location-specific information sequence for fast transmission to mobile devices which display the mapped information, compute distances from the mobile device's current position, etc. Each feature is identified by a code or byte sequence containing fields for the name, global location, and if applicable, Universal Resource Locator (URL), as well as variables for formatting and graphical symbol to be displayed or otherwise executed, aurally, for example. In operating such a system, users of mobile devices with narrow bandwidth, i.e., slow communications devices, could receive the important subset of mapping elements for a given area quickly. For example, they could receive elements such as main roads and cities and the separation, i.e., mileages and transit time, between them with which their mobile device could compute their mileage and the estimated time before arriving. Also, the mobile device itself could store standard graphical symbols for even more rapid display of such map features in the locations specified by the downloaded mapping information. Devices could then download additional information, including detailed maps, from the information provider should that be required.

Objects and Advantages of the situation information system:

- a system for providing mobile users with time-critical situation information.
- a system for providing mobile users with geographic location information, such as corrected by differential GPS.

a system for providing mobile users with a multiple-function device to generate time-critical situation information, such as that pertaining to traffic congestion, events, and emergencies, for themselves or for others at other locations.

a system for providing situation information, such as area maps, other users' current locations superimposed on an area map, and transportation schedules, to enhance the efficient mobility of the physically impaired and others.

a situation information system which provides local or proximate information, such as merchant's advertising messages, merchandise offers, and tourism site information, according to mobile users' location.

an information system with which a shopper can better serve himself or herself by, for example, determining product availability by querying a store's inventory, determining the price of products using a handheld multiple-use electronic device which includes a bar-code reading device, and electronically paying for the selected merchandise without requiring assistance from store personnel.

a system for merchants, acting on a short-term basis, to communicate special offers to customers in order to increase store traffic, reduce inventory, and increase sales.

a system for collecting a facsimile of local situation information, such as a local scene, printed materials, or graphical information, using a multiple function system which includes a digital camera.

a system in which bar-code information posted in various places in an area, one without other available locating means, is used to orient visitors to the area and aid in determining their location.

a system for providing situation information produced by a digital camera and bar-code reading device transmitted by a wireless transceiver for displaying on the user's graphical display or communicating to another device.

a system for generating situation information for vehicles derived from GPS or other peripheral device for transmission to another user for displaying on an associated graphical display.

a system for locating a transponder using a satellite positioning system time signal as gating pulse for subsequent position determination by other receivers.

a situation-information collecting and processing device for use in a vehicle which can be detached from the vehicle's systems and operated by a pedestrian user.

a system for providing situation information received from a wireless telephone with its antenna and transceiver mounted in a handheld computer and display unit and the telephone's microphone and speaker mounted in a separate, but communicatively linked, handset unit with other peripheral devices such as a digitally copying camera device and bar-code reading device.

a computer system which includes a wireless telecommunications device, the handset of which is separate from the rf transceiver and can be securely attached to the computer device when not being used.

a distributed information system for mobile users which provides local area information, for example, map, travelers' services, and geographical features information, in a concise form suitable for rapid download and display on the user's mobile device.

a mobile information system with which users could represent themselves on other user's computer displays with graphical symbols which could also be executable computer code to provide animation, sound, etc.

a wireless telephone that greatly reduces radiation exposure to the user's head area consisting of a handset, which encompasses the telephone microphone, speaker, and appropriate electronics circuitry, spatially separate from but communicatively linked to its rf transceiver by a retractable cord or infrared (IR) transceivers.

a situation information system which automatically and serially downloads from one or more selectable lists of one or more information sources or sites into memory, including storage, for viewing on later demand concurrently with the user employing information, for example, by viewing or hearing, from a previously downloaded site.

an on-line information system in which users' customary information-source selections, such as electronically accessed sites catalogued on one or more visit lists, are automatically retrieved while the user is using or viewing information from a site downloaded earlier in the session.

an on-line information search system in which users' interests, entered as lists of keywords or search terms, are automatically searched for their occurrence on each site serially downloaded from visit lists, and sites containing keywords are themselves automatically downloaded, while the user is using or viewing information from a site downloaded earlier in the session.

a mobile on-line information system in which a user can select geographically ordered information sources, which are advanced from the user's current location and have no other relationship to it, and choose to visit on the basis of the current events at that location.

an on-line system providing users with a method of locating one another in an area through the use of unique user location and direction symbols.

an on-line system that provides a sense of place in contrast to the Internet's abstract nature and lack of physicality.

## DRAWING FIGURES

The breadth of the situation information system is reflected in the many possible embodiments which take their form in various parts and arrangements of parts. The following drawings are provided for the purpose of illustrating its many aspects and embodiments and should not to be construed in any way as limiting.

FIG. **1** is a diagram of the main components of a wireless situation information system for physicallt defined environments such as shopping areas.

FIG. **2** is a diagram of a basic situation information device with graphical display showing an exemplary retail-store floor plan and other graphical situation information elements.

FIG. **3** is a diagram of the main components of a wireless situation information system for topographically irregular environments, including those in cities.

FIG. **4** is a diagram of a situation information device which includes multiple peripheral devices such as an enclosed telephone handset with digital camera and bar-code label reading device, exemplary display showing an urban plan, and other graphical situation information elements.

FIG. **5** is a diagram of the main components of a situation information system for comparatively regional, open environments.

FIG. **6** is a diagram of a situation information device with graphical display showing a exemplary metropolitan area plan and other graphical situation information elements.

FIG. **7** is a perspective drawing showing the rear view of a situation information system connected to a fixed-services bracket for use in a vehicle or building.

FIG. **8** is a diagram of the major connection components of a situation information device and fixed-services bracket in an exemplary vehicle installation.

FIG. **9** is a diagram of an exemplary embodiment of a telecommunications handset, including photonic link to its separate host device, which includes additional peripheral devices.

FIG. **10** is a perspective drawing of the use of a situation information device with separate, photonically linked handset for telecommunications in which the user simultaneously refers to information displayed by the situation information device.

FIG. **11** is a diagram of the display portion of an exemplary situation information device showing the look-ahead function displaying map elements of a given local area.

FIG. **12** is a diagram of the mappable hypertext code sequence for displaying rapidly mappable and executably selectable information, individually called mappable hypertext items, to a mobile device for display.

FIG. **13** is a flow diagram of the main components of the service provider computer control program of the preferred embodiment of a situation information system.

FIG. **14** is a flow diagram of the main components of the user computer control program of the preferred embodiment of a situation information system.

FIG. **15** is a flow diagram of the main components of the visit list computer control program of the preferred embodiment of a situation information system.

FIG. **16** is a flow diagram of the main components of the keyword-search computer control program associated with the visit list control program of the preferred embodiment of a situation information system.

Description of situation information system basic alternate embodiment in FIGS. **1** and **2**:

Referring now to FIG. **1** which shows an alternative embodiment of a situation information system used in a defined environment such as a shopping area in which can be seen rf antennas **14***a*, **14***b*, and **14***c*, the locations of which are known, and which generally transmit and receive information from mobile computers **18***a*, **18***b*, and **18***c*. Specifically in FIG. 1 antennas **14***a* through **14***c* are shown receiving information **16***a*, **16***b*, and **16***c* as well as **16***d*, **16***e*, and **16***f* from mobile computers **18***b* and **18***c*, respectively, to provide services from the service provider including finding the locations of the aforementioned mobile computers and receive information requests. In addition, antenna **14***b* is shown transmitting and receiving information **15***a* to and from mobile computer **18***a*. Antennas **14***a*, **14***b*, and **14***c* are connected to control system **36***a* by way of transceiver-A **32***a*, transceiver-B **32***b*, and transceiver-C **32***c*, respectively. Control system **36***a* is connected to data and memory components **38***a* and **39***a*, respectively, and to other systems including global communications network **31***a* by way of computer network **30***a*. In addition, control system **36***a* receives precise time signals from satellite **20***a* by way of satellite information transmission **22***a*, information reception **22***b*, satellite rf antenna **21***a*, and GPS receiver **34***a*; satellite rf antenna **21***a* is shown located outside the building structure **25** to receive satellite information.

The service provider includes transceivers **32***a*, **32***b*, and **32***c*, antennas **14***a*, **14***b*, and **14***c*, GPS receiver **34***a*, GPS antenna **21***a*, control system **36***a*, network **30***a*, data **38***a*, memory **39***a*, and communications network **31***a*. The radio locating instrument signaling function is shown operating on two devices, **18***b* and **18***c*. That of mobile device **18***b* is provided by satellite **20***a*, satellite information transmission **22***a*, satellite information reception **22***b*, satellite antenna **21***a*, GPS receiver **34***a*, severally either mobile computer **18***b* or **18***c*, information **16***a*, **16***b*, and **16***c* or information **16***d*, **16***e*, and **16***f*, respectively, antennas **14***a*, **14***b*, and **14***c*, transceivers **32***a*, **32***b*, and **32***c*, and control system **36***a*.

FIG. **2** shows a basic alternate embodiment of a situation information device **2***a* which is a handheld computing and wireless communications device with control programs specific to a situation information system such as that shown in FIG. **1**, device **2***a* includes a touch-screen graphical display unit **4***a*, controls **7***a*, **7***b*, **7***c*, and **7***d* provide user-modifiable control for device **2***a* power, display **4***a* contrast, brightness, and speaker **7***e* loudness, respectively, speaker **7***e*, IR transceiver **13***a* for communication with other devices, and rf antenna **14***d*. Aforementioned graphical display unit **4***a* shows information including retail-store floor-plan proximate information station **3***a*, floor-plan information feature exit symbol **3***b*, floor description information **3***c*, and escalator symbol **3***d*, visit list program control icon **5***a*, and service provider search hit icon **5***b*, device location and direction symbol **6***a* which symbol can be a mappable hypertext item that the user may executably select in order to receive additional information or execute computer code associated with it as described in FIG. **12** below, north direction symbol **6***b*, service provider menu **6***c*, proximate station banner **6***d*, proximate merchandise banner **6***e*, which may be made to appear animated, the latter three of which may also be mappable hypertext items, device control icon **8***a*, and display scroll icon **8***b*. Additionally, symbols of other devices, such as other device symbol **6***s* in FIG. **11**, which indicate their users' locations through the use of a graphical symbol may be shown in their appropriately mapped locations on display **4***a*.

Operation of the situation information system basic alternate embodiment shown in FIGS. **1** and **2**:

Referring to FIG. **1** in which is shown two modes of operation of subject invention, the first mode, location finding, occurs in which transceivers **32***a*, **32***b*, and **32***c* are time-calibrated and synchronized by means of precise timing signals introduced to control system **36***a*, such as from satellite **20***a* via information transmission **22***a*, information reception **22***b*, satellite rf antenna **21***a*, through building structure **25** to GPS receiver **34***a* and thence to control system **36***a*. One of transceivers **32***a*, **32***b*, or **32***c*, on an optionally rotating basis or other scheme, periodically transmits a gating pulse, via antennas **14***a*, **14***b*, and **14***c*, respectively, to a transponder (not shown) located in each of situation information devices **18***a*, **18***b*, and **18***c*, such as device **2***a* in FIG. **2**, each of which transponders subsequently respond to the received gating pulse by transmitting an rf signal such that the differences in arrival times of which the signal at each of the aforementioned antenna-and-transceiver pairs are used to compute the intersections of each envelope of distance of each of the transponder containing devices from each of the antennas and the location of each of the aforementioned devices thereby.

Accompanying each of the transponder signals is an identification code which uniquely identifies its device by means of which the location of each user is determined and identified by the situation information service provider. The

user's location coordinates are then transmitted to the user's device for incorporation into display-program variables (not shown) and presented appropriately on display **4***a* in FIG. **2**. Additionally, the service provider may wish to gather marketing and traffic data in order, for example, to determine the effect of certain merchandise or other displays on traffic patterns, speed, frequency of visitation, duration of viewing, etc.

The second mode of subject invention's operation, that of providing situation information services, occurs in which the location of the mobile situation information device **18***a*, being updated in service provider memory **39***a*, is correlated with proximate information to be transmitted, user-provided filters and options (shown in FIG. **14**, below), and requested information from, depending upon the requested information's nature and location, data **38***a*, network **30***a*, and communications network **31***a*. Certain information device users, such as that of device **18***b* used by a physically impaired user, may require alternatively conveyed information, such as that which is verbally or tactilely conveyed from an appropriately configured device.

The basic embodiment situation information device **2***a* shown in FIG. **2**, having been connected or logged on to the service provider's system in FIG. **1** and the device's position being known by the information system of FIG. **1**, i.e., residing in memory **39***a*, operates by receiving information via antenna **14***d*, conveying the information to the user via display **4***a* and speaker **7***e*, the characteristics of which information can be changed by the user via controls **7***a* through **7***d*. As the user's location, shown on the display by device location and direction symbol **6***a*, approaches within a selectable distance of proximate information station **3***a*, proximate station banner **6***d* appears on display **4***a*, followed by proximate merchandise banner **6***e* to call user's attention to, for example, a short-term offer of merchandise which, as mappable hypertext items, may be executably selected by user to provide additional information or execute as computer code as described in FIG. **12** below. User may orient himself or herself globally by north direction arrow **6***b*, within the building by floor information **3***c*, within the floor by exit symbol **3***b* near exit doors to street named on a map, and floor plan details such as escalator symbol **3***d*. Additionally, user may change or scroll the portion of floor plan in view on display **4***a* by pressing, or executably selecting, the appropriate arrow of display scroll icon **8***b* to move the view in that direction.

The user may optionally access other service provider functions by selecting from service provider menu **6***c*, other device functions, e.g., e-mail, by selecting device control icon **8***a*, conduct a search of current service-provider information and which results appear on display **4***a* by search hit icon **5***b* which is shown positioned adjacent to menu item "Contact us" which serves to implement retrieval of the desired information, or enter information through unattached peripheral devices (not shown) such as keyboards which may communicate with device **2***a* via IR transceiver **13***a*. User may optionally download other information from a prepared list of sources automatically while viewing the information currently shown on display **4***a* and view the other (see FIG. **13**), subsequently received information by executably selecting visit list control icon **5***a* causing the computer to proceed in processing or executing the pertinent information or code.

Description of situation information system alternate embodiment in FIGS. **3** and **4**:

Referring now to FIG. **3** which shows a situation information system used in environments of irregular natural or man-made topographic relief such as canyons and cities, respectively, in which can be seen rf antennas **14***e* and **14***f* of known location which generally transmit and receive information to and from pedestrian mobile situation devices **18***d* and **18***e* and vehicle mobile devices **19***a* and **19***b*, the distinction in mobile devices being that the latter is carried in a vehicle as shown in FIGS. **7** and **8**. In the figure, antennas **14***e* and **14***f* are shown receiving information **16***g* and **16***h*, from vehicle mobile device **19***a*, and **16***i* and **16***j*, from pedestrian mobile device **18***e*, to provide services from the service provider including finding the locations of mobile devices, similar to device **2***b* in FIG. **4**, and receive information requests. In addition, antenna **14***e* is shown transmitting and receiving information **15***b* and **15***c* to and from pedestrian mobile device **18***d* and vehicle mobile device **19***b*, respectively. Antennas **14***e* and **14***f* are connected to control system **36***b* by way of transceiver-A **32***d* and transceiver-B **32***e*, respectively. Control system **36***b* is connected to data and memory components **38***b* and **39***b*, respectively, and to other systems including global communications network **31***b* by way of computer network **30***b*. In addition, because topographical features **23***a* and **23***b* interfere with ground-level reception of sufficiently diverse GPS signals for reliable position determination, the aforementioned mobile devices function as transponders, signals from which devices are gated by one of the available satellite rf signals. Thus, control system **36***b* selectively receives accurate time and transponder-pulse gating signals from either satellite **20***b* or **20***c* by way of satellite information transmission **22***c* or **22***d*, respectively, information reception **22***h*, satellite rf antenna **21***b*, and GPS receiver **34***b*. In addition, vehicle mobile devices **19***a* and **19***b* are shown receiving the aforementioned time and gating signals via information reception **22***e* and **22***f*, respectively. Pedestrian mobile device **18***e* also receives the same information signals via information reception **22***g* through the device's built-in antenna (not shown).

The service provider includes transceivers **32***d* and **32***e*, antennas **14***e* and **14**f, GPS receiver **34***b*, GPS antenna **21***b*, control system **36***b*, network **30***b*, data **38***b*, memory **39***b*, and communications network **31***b*. The radio locating instrument signaling function is shown operating on two devices, **19***a* and **18***e*. That of vehicle mobile device **19***a* is provided by satellite **20***b* or **20***c*, satellite information transmission **22***c* or **22***d*, respectively, satellite information reception **22***e* and **22***h*, satellite antennas **21***b* and **21***c*, GPS receiver **34***b*, vehicle mobile computer **19***a*, antenna **14***g*, information **16***g* and **16***h*, information **16***i* and **16***j*, antennas **14***e* and **14***f*, transceivers **32***d* and **32***e*, and control system **36***b*. The radio locating instrument signaling function of pedestrian mobile device **18***e* is provided by satellite **20***b* or **20***c*, satellite information transmission **22***c* or **22***d*, respectively, satellite information reception **22***g* and **22***h*, satellite antenna **21***b* (pedestrian mobile device antennas are not shown), GPS receiver **34***b*, pedestrian mobile computer **18***e*, information **16***i* and **16***j*, antennas **14***e* and **14***f*, transceivers **32***d* and **32***e*, and control system **36***b*.

FIG. **4** shows alternate embodiment situation information device **2***b* which is a handheld computing and wireless communications device with control programs specific to a situation information system such as that shown in FIG. **2**. Device **2***b* includes a touch-screen graphical display unit **4***b*, device control **7***f*, speaker **7***g*, IR transceiver **13***b* for communication with other devices, and rf antenna **14***i*.

Graphical display unit **4***b* shows information including such as proximate information station retail store **3***e*, information features such as bank **3***f*, street name **3***g*, and side-

walk curb 3*h*, visit list program control icon 5*c* and service provider search hit icon 5*d*, device location and direction symbol 6*f*, north direction symbol 6*g*, service provider menu 6*h*, sub-menu 6*i*, which two menus are mappable hypertext items that the user may executably select in order to receive additional information or execute computer code associated with them as described in FIG. 12 below, and display scroll icon 8*c*. In the cut away portion of device 2*b* can be seen electronics enclosure 2*c* and telecommunications handset 9*a* which includes components such as extendable mouthpiece 9*b*, microphone 9*c* (shown in phantom), and mouthpiece hinge 9*d*, ear piece speaker 9*e*, digital copying camera 9*f*, camera lense assembly 9*g*, camera operation button 9*h*, and bar-code reader 9*i*. Handset 9*a* is secured by integral handset lip lid within the housing of device 2*b* by latch 11 which rotates around pivot pin 11*a* and handset 9*a* is urged from the housing of device 2*b* by the user-initiated action sequence of depressing release button 11*b* which retracts locking device 11*c* as it rotates around lock hinge 11*e* against the force of spring 11*g* allowing latch 11 to rotate relatively outwardly due to the urging of compressed spring 11*f* and stop against stop 11*h* after partially ejecting handset 9*a* from the housing. Handset 9*a* is electrically connected to device 2*b* by way of cord 13*c* which is extendably stored on spring-loaded (not shown) retracting reel 13*d*.

Operation of the situation information system alternate embodiment shown in FIGS. 3 and 4:

Referring to FIG. 3 which shows two modes of operation of subject invention, the first mode, location finding, occurs in which transceivers 32*d* and 32*e* are coordinated with local information devices and prepared to receive transponder signals by receipt of the pulse-gating timing signal introduced to control system 36*b* from appropriate satellite 20*b* or satellite 20*c* via information transmissions 22*c* or 22*d*, respectively, information reception 22*h*, satellite rf antenna 21*b* to GPS receiver 34*b*. Vehicle mobile situation information devices 19*a* and 19*b* and pedestrian mobile situation information device 18*e* receive pulse-gating signals from one of the satellites via information reception 22*e*, 22*f*, and 22*g*, respectively, and each of the devices subsequently responds by transmitting an rf signal such that the differences in arrival times between receipt of the satellite signal and the transponder signals at each of the antenna and transceiver pairs are used to chronometrically compute the intersections of each distance envelope pertaining to the separation of each of the transponder-containing mobile devices from each of the antennas and, hence, determining the location of each of the situation information devices. Accompanying each of the transponder signals is an identification code which uniquely identifies each device by means of which the location of each user is known and identified by the situation information system. The user location coordinates are then transmitted to the user's device for incorporation into display-program variables (not shown) and presented appropriately on the display as location and direction symbol 6*f*. Additionally, the service provider may wish to gather marketing and traffic data in order, for example, to determine the effect of certain merchandise displays, signs, or media presentations on traffic patterns, speed, frequency of visitation, duration of viewing, etc.

The second mode of subject invention's operation, that of providing situation information services, occurs in which information transmission pertaining to the location of pedestrian mobile situation information device 18*d* and vehicle mobile situation information device 19*b*, being updated in service provider memory 39*b*, are correlated with proximate information to be transmitted, user-provided filters and options (shown in FIG. 14, below), and response to user-requested information from, depending upon the requested information's nature and location, data 38*b*, network 30*b*, or communications network 31*b*, or combination thereof. Certain information service users, such as device 18*e* being used by a physically impaired user, may require alternatively conveyed information, such as verbally conveyed information or, for example, from a device having a tactile surface consisting of a dynamic bed of changeable, flat-top pins for conveying information tactilely (not shown).

The basic situation information device 2*b* shown in FIG. 4, having been connected or logged on to the system and its position being known by the situation information system of FIG. 3, operates by receiving information via antenna 14*i*, conveying the information to the user via display 4*b* and speaker 7*g*, the characteristics of which can be changed by the user via controls including control 7*f*. As the device user's mapped location, shown on the display by device location and direction symbol 6*f*, approaches within a selectable distance of environment proximate information features, such as retail store site 3*e*, an advertising message such as service provider menu 6*h*, or an optional advertising message (not shown), would appear on the display awaiting the user's request for information or services. This operational description assumes the user has initiated a service-provided keyword search for information about "Hiking Gear". Should the user also wish to know, for example, what the merchant's current, short-term offers are, the user would select the menu portion entitled "1 hr. Specials" which causes sub-menu 6*i* to appear on the display showing categories of merchandise included in the aforementioned offers. Search hit icon 5*d*, with "Hiking Gear" message which is similar in use to that of search hit icon 5*b* above, is shown overlapping the portion of the submenu entitled "Children's" which indicates that a 1 hr. Special in the Children's Dept. offering Hiking Gear is currently in effect. The system user, indicated by device location and direction symbol 6*f* and which may be a mappable hypertext item as described below in FIG. 12, may orient himself or herself globally by north direction arrow 6*g*, by building occupant information such as store 3*e* and bank 3*f*, by street name 3*g* on map, and sidewalk curb 3*h*. User may elect to receive information from other service providers by operating a visit list program (shown in FIG. 13), in which case, executably selecting visit list control icon 5*c* would cause the first site's information to be presented on the display. Additionally, the user may change or scroll the portion of map in view on the display by pressing the appropriate arrow of display scroll icon 8*c* to move the view in the arrow's direction.

Referring still to FIG. 4, handset 9*a* is released from latch 11 by the depression of latch release button 11*b* which causes the latch to deploy handset 9*a* by urging integral lip 11*d* relatively outwardly as described above. Handset 9*a* may be used for multiple functions including voice communications by initiating telecommunications operations through selecting the appropriate display-based menu group (not shown), speaking through speaker 9*c* in mouth piece 9*b*, which, urged by spring (not shown), deploys rotationally about pivot 9*d* as handset is deployed from device housing as the user pulls relatively outwardly against retractile force of spring-loaded (not shown) reel 13*d* acting on cord 13*c*, listening through speaker 9*e*, through transceiver means (not shown) located substantially within electronics enclosure 2*c*, and radiatively to service provider, including other telecommunications services, through antenna 14*i*. Alternatively, after executably selecting appropriate display-based settings (not shown) digital copying camera 9*f* peripheral device,

located within handset **9***a*, may be used in place of a document scanner for digitally copying documents or recording scenes by framing subject matter appropriately in view of display **4***b* and pressing button **9***h* to record the viewed scene through lense **9***g*.

Because lense diameters of digital camera units are of the order of a quarter of an inch, hyperfocal distances are significant and, therefore, a general-purpose camera can have a fixed-position lense. A subset of recorded, i.e., captured image, subject's graphical information (not shown) can be displayed on the display in order to reduce bandwidth requirements and, therefore, time required to begin recording a subject. Handset **9***a*, when appropriately deployed and configured by display-based settings (not shown) includes UPC bar-code reader **9***i* peripheral device for reading and deciphering bar-code labels on street signs to determine map coordinates and names of intersecting streets should situation information service be unavailable, for example, or information about products, and storage container contents. Information derived from copied documents, digitized scenes, or deciphered bar codes, can be communicated to other users on other systems, networks, or communication modes through the service provider. Handset **9***a* may alternately be constructed to communicate wirelessly with device **2***b* as with device **2***e* shown in FIG. **10**.

Description of situation information system preferred embodiment in FIGS. **5** and **6**:

Referring now to FIG. **5** which shows a situation information system for use in comparatively open environments which includes transceiver **32***f* which generally transmits and receives information to and from mobile situation devices located in vehicles **19***c* and **19***d* by way of rf antenna **14***h*. Transceiver **32***f*, by way of its antenna, is shown transmitting and receiving information **15***d* and **15***e* to and from the mobile devices (not shown) represented as being located within vehicles **19***c* and **19***d*, respectively, by means of antennas **14***i* and **14***j*, respectively, in the manner shown in FIGS. **7** and **8**, below. Transceiver **32***f* connects to control and data system **36***c*, which, in turn, connects to differential computer **38***c* and memory **39***c* and to other systems including global communications network **31***c* by way of computer network **30***c*. Control and data system **36***c* receives GPS signals from satellites **20***d*, **20***e*, and **20***f* by way of satellite information transmissions **22***i*, **22***j*, and **22***k*, respectively, information reception **22***p*, GPS antenna **21***e*, and GPS receiver **34***c*. The mobile devices located in vehicles receive GPS signals from the satellites via satellite information transmissions **22***i*, **22***j*, and **22***k* and information reception **22***m* and **22***n*, respectively, and GPS receivers **21***f* and **21***g*, respectively, as further shown in FIG. **8**.

The service provider includes transceiver **32***f*, antenna **14***h*, GPS receiver **34***c*, GPS antenna **21***e*, control system **36***c*, network **30***c*, differential computer **38***c*, memory **39***c*, and communications network **31***c*. The radio locating instrument signaling function for vehicle mobile device **19***c* is provided by satellites **20***d*, **20***e*, and **20***f*, satellite information transmission **22***i*, **22***j*, and **22***k*, respectively, satellite information reception **22***m* and **22***p*, satellite antennas **21***e* and **21***f*, GPS receiver **34***c*, antennas **14***i* and **14***h*, information **15***d*, transceiver **32***f*, and control system **36***c*. The radio locating instrument signaling function for vehicle mobile device **19***d* is provided by satellites **20***d*, **20***e*, and **20***f*, satellite information transmission **22***i*, **22***j*, and **22***k*, respectively, satellite information reception **22***n* and **22***p*, satellite antennas **21***e* and **21***g*, GPS receiver **34***c*, antennas **14***j* and **14***h*, information **15***e*, transceiver **32***f*, and control system **36***c*.

FIG. **6** shows a preferred embodiment situation information device **2***c* which is a handheld computing and wireless communications appliance with control programs (not shown) of the situation information system such as that shown in FIG. **5**. Device **2***c* includes a touch-screen graphical display unit **4***c*, device controls **7***h*, **7***i*, **7***j*, and **7***k*, speaker **7***m*, IR transceiver **13***e* for data communication with other devices, and rf antenna **14***k*. The graphical display unit, display **4***c*, shows information including regional highways **3***i*, highway information **3***j*, visit list program control icon **5***e* and service provider search hit icon **5***f*, device location and direction symbol **6***j*, north direction symbol **6***k*, traffic congestion indication **6***m*, traffic congestion legend **6***n*, device control icon **8***d*, display scroll icon **8***e*, look-ahead icon **8***f*, proximate information menu **6***p*, and proximate information submenu **6***q*, which latter two menus and device location and direction symbol **6***j* may be mappable hypertext items as described below in FIG. **12**.

Operation of the situation information system preferred embodiment shown in FIGS. **5** and **6**:

Referring to FIG. **5** in which vehicle-located mobile situation information devices **19***c* and **19***d* of subject invention can be seen providing situation information, in the form of mobility-related information about each of the devices as well as information and services requests, by way of antennas **14***i* and **14***j*, respectively, and information **15***d* and **15***e*, respectively to the situation information service provider by way of antenna **14***h*, and the devices themselves receiving situation information from the provider, in the form of processed traffic data, other proximate situation information, and other services. The approximate locations of the devices are derived from timing signals received from the GPS satellite constellation, i.e., those satellites available for providing positioning information, of GPS satellites **20***d*, **20***e*, and **20***f* by way of satellite transmitted information **22***i*, **22***j*, and **22***k*, respectively, to devices **19***c* and **19***d* by way of satellite received information **22***m* and **22***n*, respectively, and GPS antennas **21***f* and **21***g*, respectively. As the devices' users log on to the situation information service provider by broadcasting users' identification codes and, optionally, global coordinates, the service provider responds with each user's channel assignment, which channel may be a specific rf, a digital-code channel, or another communications channel selection scheme. Note that the service provider receives GPS information **22***p* from the GPS satellite constellation to GPS receiver **34***c* by way of GPS antenna **21***e*, and the information is processed by differential computer **38***c* to derive the corrections necessary to produce mappably accurate global position or coordinates of the mobile device's GPS antenna and those of other users substantially throughout the service provider's service area. At an early point in a communication session the service provider may also respond to each user with GPS corrections specific to each satellite currently in use by the situation information system and the users such that the devices compute differentially corrected global positions.

Alternatively, given sufficient information communication and processing bandwidth, the service provider may compute each user's corrected position coordinates and transmit each user's coordinates back to the appropriate user. Users' positions may be broadcast to all pertinent users such as shown in FIG. **11** and its associated description. The service provider receives and transmits the information with transceiver **32***f* by way of the antenna **14***h*, computes corrected global position, correlates actual position and velocity data collected individually from users' periodic transmissions in control and data system **36***c*, interpolating as appro-

priate to provide graphically integral information from sparse data sets, and transmits the corrected position data individually and correlated position and velocity data to all users, providing the users with coherent, timely information. The service provider updates information about the location of the devices in service provider memory **39***c*, which is then correlated with proximate information to be transmitted and modified by user-provided filters and options shown in FIG. **14**, below. Additionally, the service provider responds to the users' requests for services including proximate situation information, communications services to other of the aforementioned devices, services to other networks **30***c*, and services to communications network **31***c* for remote access to other systems, for example.

Information device **2***c* in FIG. **6**, being located within a vehicle with connection to external antennas, as shown in FIGS. **7** and **8**, is assumed to having been connected to or logged on to the service provider's system and the device's position being known by the situation information system of FIG. **5**, i.e., residing in memory **39***c*, operates by receiving information by way of antenna **14***k*, conveying the information to the user with display **4***c* and speaker **7***m*, the characteristics of which can be changed by the user through device controls **7***h* through **7***k*. As the user's location, shown on the display by device location and direction symbol **6***j* as being in the eastbound lane of K. Goedel Blvd., approaches within a selectable distance of the proximate interchange, proximate information menu **6***p* appears on the display or alternatively may be executably selected to appear by the user as shown in FIGS. **11** and **12**, including proximate submenu **6***q* to provide user with information pertinent to the attractions located near the relatively approaching highway interchange. Traffic congestion indication **6***m*, is interpreted by means of traffic congestion legend **6***n* and which may be interpolated from a sparse data set, may induce user to alter travel direction or telephone his or her delay by way of telephone handset **9***j*. User may also orient himself or herself globally by north direction arrow **6***k*, within the interchange area by referring to map details such as highway outlines **3***i* and highway name **3***j*.

Additionally, user may change or scroll the portion of area plan in view on the display by executably selecting the appropriate arrow of display scroll icon **8***e* to move the viewing window in that direction. User may optionally access other device functions, e.g., e-mail, by executably selecting device control icon **8***d*, conduct a search of current service provider information, in this example "EnergySta (tions)" and which results appear on the display by service provider search hit icon **5***f* which is shown positioned adjacent to menu item "AutoServices" which serves to implement retrieval of the desired information, or enter information through unattached peripheral devices (not shown) such as keyboards which may communicate with the device via IR transceiver **13***e*. User may optionally download other information from a prepared list of sources (see FIG. **13**) while viewing the information currently shown on the display and view the aforementioned other information by pressing visit list control icon **5***e*. Look ahead icon **8***f* selectably provides information for areas beyond user's current area as described in FIGS. **11** and **12** and below.

Description and operation of situation information system preferred embodiment in FIGS. **7** and **8**:

FIG. **7** shows a situation information device **2***d* inserted in insertion direction **41***a* into interface bracket **40**, which includes tilt-adjustment hinge **40***a* and, at the rear of the bracket are external power supply cable **42***a*, local network circuit **42***b*, external input cable **42***c*, external GPS antenna circuit **42***d*, and external rf antenna circuit **42***e*. For advantageous viewing bracket **40** may be optionally rotated on the axes represented by tilt arrow **41***b* and swivel arrow **41***c*.

Referring now to FIG. **8** which shows a diagram of device **2***d* in the process of being inserted into and connected to bracket **40**, shown by insertion arrow **41***d*, for the purpose of connecting to off-device resources including power supply cable **42***a*, network circuit **42***b*, input cable **42***c*, GPS antenna circuit **42***d*, and rf antenna circuit **42***e* by way of bracket connector pins **44***a* through **44***e*, respectively, substantially contained in interface bracket **40**. Upon insertion of the device into the bracket, bracket pins **44***a* through **44***e* respectively connect to corresponding pin receptacles **45***a* through **45***e*, which are connected to power supply switch circuit **43***a*, network interface **43***b*, input interface **43***c*, GPS antenna switch circuit **43***d*, rf antenna switch circuit **43***e*, respectively, integral with the device. The GPS antenna circuit receives external GPS information **22***r* by way of GPS antenna **21***h* which directs the information signal through structure **25***a*; similarly, the rf antenna circuit receives external rf information **15***k* by way of rf antenna **14***j* which, by way of its associated circuitry, directs the information signal through interposing structure **25***a*.

The aforementioned circuits and interfaces include electronics components and configurations appropriate to the impedance balancing, powering, and information exchange between device **2***d* and the external systems or off-device resources, including interconnection when one or more of the device circuits and off-device resources are energized and operating, commonly referred to as hot plugging. Structure **25***a* includes building and vehicle structures. Network circuit **42***b* includes, for example, the Secure Personal Applications Network, U.S. patent application Ser. No. 08/613,725 Hollenberg. Device **2***d* may be removed from the bracket for hand-held use, for example, pedestrian use, by pulling the device in a direction relatively outwardly, in the reverse direction to that indicated by arrow **41***d*, and device **2***d* modifies its configuration to use internal or device resources only. The performance of the situation information device is increased and extended by connecting it to off-device resources or external systems. For example, device **2***d* may be inserted into bracket **40** mounted in a vehicle for greater operative mobility and used for networking with vehicular systems. Alternatively, bracket **40** may be mounted in a retail store location to which device **2***d* may be attached for composing e-mail using a keyboard supplied for customer use by the store. Yet other alternatives include a keyboard which may be stored within the device that slides out for use (not shown) or a separate keyboard that communicates by a photonic, including IR, link.

Description and operation of situation information system alternative embodiment in FIGS. **9** and **10**:

FIG. **9** shows wireless telephone handset **9***k* which includes peripheral devices including digital copying camera **9***m*, camera lense **9***n*, camera record button **9***p*, digital/analog conversion and memory circuitry **9***q*, bar-code reader **9***r*, handset speaker **9***s*, energy storage **9***t* and **9***u*, deployable mouthpiece **9***v*, handset microphone **9***w*, mouthpiece hinge **9***x*, mouthpiece deployed position **9***y*, and IR transceiver **13***f*.

FIG. **10** shows handset **9***k* in use as a telephone handset by user **19***f* in which digitized voice data is communicated to and from situation information device **2***e*, which includes handset storage space **2***f*, by bidirectional information communication **13***g*, which is received by device **2***e* through an IR transceiver (not shown) similar to that of IR transceiver **13***c* in FIG. **6**. Device **2***e* includes rf transceiver (not shown)

which transmits information **15***m* by way of radiative antenna **14***k* which is appropriately positioned away from the user's head area in order to reduce the rf radiation dose absorbed in the user's vital organs, particularly the brain. This reduction of rf radiation occurs according to the inverse-square law in which the radiation at a given distance from the original distance varies inversely proportionally to the square of the factor of change in distance. Thus, by doubling the separating distance, radiation received decreases to one-fourth the original; by ten times the separation, the radiation diminishes to one-hundredth of the original. Additionally, certain CMOS microchips, such as those potentially used for gathering light in digital cameras, are susceptible to EMWR interference.

By way of explanation of FIG. **10**, as the user deploys the handset for use from storage space **2***f* in the device, handset mouthpiece **9***v* deploys by rotating about hinge **9***x* of FIG. **9** through the urging of a spring (not shown), and the device provides the telephony function when the user selects the appropriate menu function set (not shown) on the display of the device. The transceiver and the radiative antenna are naturally positioned away from the user who may view data displayed (not shown) by the device during a telephony function. Alternatively, user may generate situation information by copying documents or recording scenes using the copying camera or bar-code reader peripheral devices to generate information reader for communication to the device via the IR link.

Description and operation of situation information system device display and mappable hypertext code sequence in FIGS. **11** and **12**:

FIG. **11** shows a portion of device **2***g* with display **4***d* which displays exemplary map data of locations in advance of the mobile user's current location and is called a look ahead session. The graphically displayed map data, which may consist of mappable hypertext code sequences such as that shown in FIG. **12**, includes element road **3***k*, elements Deneba **3***m* and Pietown **3***n* which represent towns, element mountain **3***p*, and element Airport **3***q*. Shown also are visit list control icon **5***g*, device location and direction symbol **6***r*, other device symbol **6***s* which is a symbol representing the location of another similar device whose user has selected that the symbol be displayed along with other device information **6***t* which shows that other user's name, vehicle description as a green Toyota, and an executable option to contact the other user by e-mail or through other optional communications methods. Continuing with FIG. **11** and the contents of display **4***d* are look ahead information menu **6***u*, look ahead list **6***v*, mileage tabulation **6***w*, estimated transit time **6***x*, north direction symbol **6***y*, device control icon **8***g*, display scroll icon **8***h*, and look ahead icon **8***i*. FIG. **12** shows mappable hypertext code **29** consisting of element item reference **29***a*, identifier **29***b*, location **29***c*, and data type **29***d*.

A computer memory organized to include mappable hypertext code sequence **29** in FIG. **12** provides for rapid display of mappable information items, including map features, information sources, names, menus, and lists, certain of which may be executably selected by a user in order to display additional information related to any of such items, called a hypertext element, by receiving new information transmitted from the service provider. Additionally, code **29** provides for graphically displaying on the user's display symbols and text appropriately relating to the items and in a manner which shows each item in a measurably appropriate relation to other such items of geographical features shown on the display in an information sequence of data elements. Element item reference **29***a* is a code which determines the ordering of a particular element in a display of a table of similar such items or within a database of such information.

For example, should code **29** refer to a merchant desiring out-of-order placement of the merchant's information in an ordered display of similar information, item reference **29***a* would be appropriately changed to automatically provide the out-of-order placement on a user's display of such information. Element identifier **29***b* provides the mapped item's name and, if applicable, the location or address, which may be a URL, of its additional information. Element location **29***c* provides the item's geographical location, in longitude and latitude or in reference to a given feature which the element location provides. Element data type **29***d* provides information as to whether the item's symbol, icon, or name is capable of being included with other items in a executably selectable menu which appears to pop up, that is, to quickly graphically appear adjacent to the icon or text item which was executably selected by the user, on the user's computer display, whether it is to be included in the map displayed on user's computer, and, if displayed, whether the item's symbol, which may be a standard display symbol which is resident in memory, including storage, on user's device, or the item name can be subsequently selected by a user to automatically provide additional information about the item, such as by enlarging the detail, called zooming in, or, for example, as hypertext, in which the item name or symbol can be selected or clicked on by a user to provide additional information. Data type **29***d* also includes executable code for animated icons or avatars (graphic elements which represent their users in such a display). Concise code such as mappable code **29** is particularly suited to low bandwidth information communication systems such as those which might be found in large areas.

After connection with the local information service provider, the user's location and look ahead request, initiated by selecting look ahead icon **8***f* in FIG. **6**, are communicated to the service provider which responds by sending the appropriate information. Device **2***g* receives mappable hypertext code for each item to be represented on the display, such as items **3***m*, **3***n*, **3***p*, **3***q*, and main roads. Items having standard display symbols resident in the device's memory, including storage, are called by the display program and displayed to expedite the display process by obviating transmission of that data. A linear element such as a road may be transmitted as a bit map or as multiple mappable hypertext codes to usefully display its changes in direction or as a single code with multiple location elements to indicate the start and stop location of each segment and features such as curves, intersections, etc. All the aforementioned items are displayed according to their geographic locations in the scale of the area to be viewed on the display, which area to be viewed is selectable and may be zoomed in or out, for example, along with user's location symbol **6***r*.

Other user symbol **6***s* provides a method to communicate with other device users, and use of such a symbol is optional to the user owning the symbol, as is the amount of information provided with the symbol which is executably selectable, as shown by other device information table **6***t*. Information which may be executably selected by user in order to receive additional information is arranged as executably selectable menus or hypertext items under look ahead icon **8***i*, including look ahead menu **6***u* and look ahead list **6***v*. Separations between displayed features such as user's location **6***r*, elements Pietown **3***n* and Deneba **3***m*, which are towns connected by exemplary highway **22**, as

well as to other listed towns, are calculated using distances derived from latitude and longitude, which have been appropriately converted to distance relationships, i.e., correcting local longitude for the local latitude prior to determining the map distance, and provided to the user as mileage tabulation **6***w* and estimated transit time **6***x* to other exemplary cities. Portions of the map lying outside the displayed area may be scrolled into view using scroll icon **8***h*.

Description and operation of situation information system service provider computer control program and user computer control program in FIGS. **13** and **14**:

FIG. **13** shows a flowchart, with element numbers within brackets, of SERVICE PROVIDER COMPUTER CONTROL PROGRAM <**90**>, generally consisting of computer controlling instructions and evaluations, by which subject invention, particularly, for example, control and data system **36***c*, processes users' communicated data and requests for information and services. After situation information service provider system loads the program at instruction ENTER <**91**>, the program collects stored operating parameters and data at INITIALIZE <**92**> and is then operationally able to provide sessions of user services. A typical user logs on at CONNECT USER <**93**> and the system determines user's validity by comparing user identification (ID) and password with memory-stored copies, assigns user a communications channel or channels through which further interactions are conducted, and receives user device location data at RECEIVE USER DATA & REQUEST FOR SERVICES <**94**>. The user data is processed to determine actual user device location and, optionally from receipt of subsequent location updates, velocity at PROCESS USER SITUATION DATA <**95**>. User location data is correlated with data from other users to provide near real time, vehicular traffic-pattern situation information for transmission to other users' devices for graphical display or, in the case of pedestrian traffic, for analysis in marketing studies or other use studies.

At UPDATE USER SITUATION INFORMATION <**96**> user's device location is transmitted to user's device for display accompanied with, for example and if appropriate to user's situation, graphical vehicular traffic pattern information. User information filters, which selectably limit and define the types of information the user suitably requires, and options include, prearranged communications services required by user on a regular basis, such as remote access to other computer networks, news services, including market data, etc., are received by the service provider which then updates them appropriately in UPDATE OPTIONS/FILTERS RECEIVED FROM USER <**97**>. Based upon user filters, options and location, the service provider selects appropriate information from the system database (DB) specific to user situation in SELECT DB INFORMATION FOR USER'S SITUATION <**98**>, and this information is transmitted to the user in PROVIDE SITUATION INFORMATION & SERVICES <**99**>. If the service provider receives new data or a services request from the user, that is, if evaluation RECEIVE NEW DATA OR SERVICES REQUEST? <**100**> evaluates to YES, the processing of program <**90**> loops back to instruction PROCESS USER SITUATION DATA <**95**>. However, should the user not send new data or request services such that evaluation RECEIVE NEW DATA OR SERVICES REQUEST? <**100**> evaluates to NO, the service session ends at RETURN <**101**>.

FIG. **14** shows a flowchart, with element numbers within brackets, of USER'S COMPUTER CONTROL PROGRAM <**120**>, generally consisting of instructions and evaluations, by which subject invention, particularly, for example, situation information device **2***c*, requests information and services and subsequently processes the information communicated from the service provider. After situation information device **2***c* loads the program at instruction ENTER <**121**>, the program causes the device to collect stored operating parameters and data from memory at INITIALIZE <**122**> and is then operationally able to begin a session. As user selects service provider and logs on at LOG ON TO SERVICE PROVIDER <**123**>, the device transmits user's ID and password, switches to assigned communications channel or channels through which further interactions are conducted. At DISPLAY EST. LOCATION <**124**>, user's position as of the last operation of user's device will show on user's display. At evaluation EST. MAP LOCATION ADEQUATE? <**125**>, user checks the display and, should the displayed position appear obviously incorrect, user may select NO and, at the prompt ENTER EST. LOCATION <**126**>, update the position manually. Should evaluation <**126**> evaluate to YES, processing continues to instruction SELECT FILTERS AND OPTIONS <**127**> in which user may selectably define the type of information required from the service provider and options required, such as remote access to a company computer network, e-mail, or display of location of selected alternate situation information devices such as a transponder carried by a child, advertising messages, etc. All such selections and information requests are sent, along with periodic location information reports or data, to the service provider at SEND REQUEST/DATA TO PROVIDER <**128**>.

Situation information from the service provider, including map-referenced information, advertisers' and merchants' messages, weather, news, including traffic congestion graphical data and accident reports, if appropriate to user's situation, filters, etc., are received at RECEIVE INFO. FROM PROVIDER <**129**>, at which point device **2***c* will update its data at UPDATE LOCAL SYSTEM <**130**>. Program <**120**>next proceeds through a series of evaluations of user's actions including whether user's location has changed at LOCATION CHANGED? <**131**>, which, if evaluating to YES, corresponds, for example, to the equivalent of the user having generated additional data and processing loops back to SELECT FILTERS AND OPTIONS <**127**>, and, if the filters and options remain unchanged, continues to send data in aforementioned instruction <**128**>. However, should user's location remain unchanged within the limits set by service provider according to computational bandwidth constraints, for example, or through the user's selection, and evaluation <**131**> evaluate to NO, program <**120**> next evaluates whether or not the user's device has recorded a new request for services, including information requests, at REQUEST SERVICES? <**132**> in which a YES evaluation causes processing to loop back to instruction <**127**>. Next, should no services or information be requested and evaluation <**132**> evaluate to NO, opportunity to change providers is offered with evaluation GO TO NEW PROVIDER? <**133**>, which, should user elect YES, causes the program to loop back to LOG ON TO SERVICE PROVIDER <**123**>. Should evaluation <**133**> evaluate to NO, user is queried as to whether or not the current session should be continued at evaluation CONTINUE SESSION? <**134**>, which, if evaluating to YES, causes processing to loop back to REQUEST SERVICES? <**132**>. Finally, should evaluation <**134**> evaluate to NO, program <**120**> may be terminated at RETURN <**135**>.

Description and operation of situation information system visit list computer control program in FIG. **15**:

FIG. **15** shows a flowchart, with element numerals within brackets, of VISIT LIST COMPUTER CONTROL PRO-

GRAM <200>which downloads sites from a list of information sites to devices such as device 2*c* during the time the user views, otherwise uses, or executes information obtained from sites downloaded earlier, including from other sources. The program generally consists of instructions and evaluations, by which subject invention, particularly, for example, situation information device 2*c* and visit list control icon 5*e* of FIG. 6, may be optionally employed by user to select among serially downloaded information providing sites. After the situation information device loads the program at instruction ENTER <201>, the program collects stored operating parameters and data at INITIALIZE <202> and is then operationally ready to begin the session. As user selects which of an optional plurality of visit lists to begin downloading, depending upon a commuting, vehicle-bound user's direction of travel or time of day or a stationary user's accustomed perusal of financial information, as examples, at instruction SELECT VISIT LIST <203>, a menu of available lists are caused to appear on device display 4*c* of FIG. 6 and a first visit list (not shown) is selected to take priority. The visit lists consist of a given number of information-providing sites on one or more networks of sites, to each of which is serially assigned a first number (not shown), which may be a pointer or reference to other appropriate locations in memory, for the purpose of numerically ordering the first list's sites' downloading, a download number, and a second number (not shown) for the purpose of ordering the first list's sites' execution, called an execute number, that is, making use of a given site's downloaded information by displaying, executing or processing the site's code, or otherwise making use of its information.

Further, download and execute numbers are each loaded into computer memory, such as a stack, an array, or a register (not shown), as examples. The first number is variously referred to herein as "download counter", "D/L CTR", or "D/L CT.", and the second number variously referred to herein as "Exe counter", "EXE CTR, or "EXE CT.", depending upon the drawing space appropriately available. After the visit list is selected, subject program <200> loads the first visit list's number of sites as first and second numbers in the download and execute counters, respectively, in LOAD D/L & EXE COUNTERS <204>. The visit list program, in order to accomplish its two primary tasks in apparent concomitance of the viewing or executing portion to the downloading portion, the latter taking precedence or priority because of the time-dependent nature of such downloading, requires the effect of simultaneous computer processing, such as multitasking or multiple program threads, or actual multiple processing by multiple processors. The program utilizes, for example, multitasking which is well understood in the computer industry and entails the switching from one task to the other, usually governed by a priority scheme, by a single processor by way of its control program or operating system. The multitasking begins with instruction BEGIN MULTITASKING <205> which allocates and arranges memory to receive each task's parameters as the computer switches from the site downloading task to the site execution task and back again, as necessary until tasks are completed. In operation, portions of the downloading site information may be stored in a buffer and subsequently moved to memory, including storage.

The site downloading task begins with the first site in the visit list, denoted by the first site's assigned serial downloading counter number occupying proximal position in memory, in D/LOAD SITE #(D/L CT.) <206>, where "(D/L CT.)" is the proximate number in the download counter and refers to the next visit list site address. Should a site not download in a timely fashion, program <200> provides a message to alert the user to the delay and to which the user may respond by selecting PROCEED 231. With downloading of site information completed, the download counter is decremented, i.e., reduced by one, in DECR. D/L COUNTER <208> and the download counter content is evaluated in D/L CTR>0? <210>. Should there be additional sites in the visit list to download, evaluation <210> evaluates to YES and processing loops back to download the next site in D/LOAD SITE #(D/L CT.) <206>. If any site cannot be reached or its downloading halts, D/L MESSAGE 212 provides that site's name. Should downloading be successful for all sites of the list which are capable of being located and downloaded, evaluation <210> evaluates to NO and a message is presented to the user that list downloading is completed in D/L MESSAGE <212> and processing proceeds to terminate multitasking at END MULTITASKING <220>.

The execution task begins at EXEC. SITE #(EXE CT.) <207> in which the site corresponding to the proximate site address in the execute counter and, initially, may be the site currently being downloaded, in which case the downloading task, specifically, the rate of the downloading, will take precedence over the execution task. After a given site is executed by, for example, being displayed on the device's display, the execute counter is decremented in DECR. EXE COUNTER <209> and processing proceeds to determine whether or not site downloading is advancing ahead of site execution by comparing the counters in evaluation D/L CTR<EXE CTR? <211>. Should the download counter equal the execute counter, that is, the same site being downloaded is being executed, evaluation <211> evaluates to NO and a "wait" message is presented to user, by way of the display or other means, in WAIT ICON <213> and processing returns to evaluation <211>. Should downloading be advanced in relation to execution and evaluation <211> evaluates to YES, processing proceeds to determine whether or not sites remain to be executed in EXE CTR>0? <215>, which causes, should there be more sites to execute and evaluation <215> evaluates to YES, processing to loop back to execute the next site in EXEC. SITE #(EXE CT.) <207>. If, to the contrary, evaluation <215> evaluates to NO, processing proceeds to query the user as to whether or not to repeat the current visit list execution in evaluation REPEAT EXE? <217>. Should execution repetition be selected and evaluation <217> evaluate to YES, the execution counter is reloaded at LOAD EXE CTR <219> and processing loops back to the beginning of the execution task at instruction <207>. If evaluation <217> evaluates to NO, multitasking terminates at END MULTITASKING <220>, similar in manner to the downloading task.

Processing continues at evaluation REPEAT D/L LIST <221> which repeats the downloading and execution of the same list sites in the event the user requires more current information from the aforementioned sites, which, if selected, causes processing to loop back to instruction LOAD D/L & EXE COUNTERS <204>. Should this evaluation evaluate to NO, the evaluation ADD NEW SITE? <222> is processed next and, evaluating to YES, processing continues to ADD NEW SITE ADDRESS <223>, in which one or more new site addresses are added, and thence to increment the download counter and the execute counter at INCR. D/L & EXE COUNTERS <224> appropriately before looping back to download and execute the added sites. Should evaluation <222> evaluate to NO, processing continues to evaluate whether or not the user wished to change to a new visit list at GO TO NEW LIST? <225> which, if evaluating to YES, processing loops back to select

a new visit list at SELECT VISIT LIST <203>. Should evaluation <225>evaluate to NO, sites located by keyword search program <300> in FIG. 14 and added as "temporary sites" to the visit list program <200> are deleted in DELETE TEMP. SITES <226> and program ends at RETURN <227>.

Additional instructions which operate globally on program <200> include PROCEED <231> and GO TO NEW LIST <232> which serve to interrupt the program at selectable locations in the course of the program's operation in order to provide for efficacious utility and, for purposes of simplifying their description, are shown in currently referred to FIG. 13 as not directly connected to the program. Interrupt instruction PROCEED <231> is optionally implemented by user actuation of icon 5*e*, and similarly to alternate embodiment icons 5*a* and 5*c* in FIG. 2 and FIG. 4, respectively, to cause program <200> to halt the processing of currently executing code and begin processing code referred to by the next number in the execution counter. For example, while viewing currently executing code from any given site, the code of a serially following site on the visit list is executed after PROCEED <231> is actuated and the executing code is appropriately halted. Instruction PROCEED <231> may optionally be used, as described above, for terminating the downloading of a slow-to-download site in favor of the downloading of a serially following site may proceed. The second of these global instructions, GO TO NEW LIST <232>, is actuated by user by way of a similar operation on an icon or menu item (neither of which is shown) in order to download or execute code of one or more sites on a list other than the current list.

Description and operation of situation information system keyword search computer control program in FIG. 16:

FIG. 16 shows a flowchart, with element numerals within brackets, of Site Keyword-term Search Computer Control Program <300> which searches information sites downloaded to devices including device 2*c* during the course of situation information system use including visit list program <200> in FIG. 13 and, for keyword terms found, adds the site, as a URL or address, associated with the keyword term, if available, to the visit list as a temporary site. Program <300> generally consists of instructions and evaluations, by which subject invention, particularly, for example, device 2*c* and visit list control icon 5*e* of FIG. 6, may be optionally employed by a user to select among such subsequently serially downloaded information providing sites. After device 2*c* loads the program at ENTER <301>, the program collects stored operating parameters and data, including data from a user-prepared list of keyword terms, at INITIALIZE <302> with which to subsequently perform a search for the keyword terms on each of the sites downloading or downloaded. LOAD SITE COUNTER <303> loads the site references, each of which may be, for example, a pointer to a memory location containing the URL or other appropriate connection path to the information source or site, from the visit list program's download counter into computer memory, such as a stack, an array, or a register (not shown), for example, and referred to herein as the site counter, and functions to maintain a record of which site is being searched.

Before proceeding, program <300> determines if at least one site has been fully downloaded by visit list program <200> and available for searching by evaluating whether or not the original download count in program <200> is greater than the current download count in program <200> in ORIG.+INCR. D/L CT.>CURR. D/L CT.? <304>. Should this evaluation evaluate to NO, processing proceeds to WAIT <305>, where it remains for a selectable period of time before looping back to evaluation <304> for re-evaluation. Should evaluation <304> evaluate to YES processing proceeds in a manner similar to instruction <303> above in which LOAD SEARCH COUNTER <306> loads keyword references into computer memory, which may be register pointers to keywords in memory, to maintain a record showing which keywords are being searched. The first search site and search keyword are selected and searched in SEARCH SITE #(SITE CT.) FOR TERM #(SEARCH CT.) <307>, where SITE CT. is the current count in the site counter and SEARCH CT. is the current count in the search counter, after which search aforementioned counter <306> is decremented in DECR. SEARCH COUNTER <308> to prepare for selection of the next search term or keyword. Should the currently searched-for term not be found, that is, TERM FOUND? <309> evaluates to NO, processing proceeds to check that at least one search term remains for searching in SEARCH COUNT>0? <312>. If the searched-for term is found in information contained in the current site, evaluation TERM FOUND? <309> evaluates to YES and determination is made in SITE ADDRESS? <310> whether or not an associated site address for the currently searched-for term can be found, which if not, evaluation <310> evaluates to NO and processing continues in SEARCH COUNT>0? <312>. Otherwise, with the associated address being found and this evaluation evaluating as YES, the site address associated with the searched-for term is added to visit list program <200> of FIG. 15 in current program <300> instruction ADD SITE TO VISIT LIST (AS TEMPORARY SITE) <311> before processing proceeds to SEARCH COUNT>0? <312>. Should terms remain to be searched in the current site information, SEARCH COUNT>0? <312> evaluates to YES and processing loops back to SEARCH SITE #(SITE CT.) FOR TERM #(SEARCH CT.) <307> to search for the next keyword search term.

Should SEARCH COUNT>0? <312> evaluate to NO, the site counter is decremented in DECR. SITE COUNTER <313> in preparation for searching the next site. In the event additional sites have been added to visit list program <200>, for example by ADD NEW SITE? <222> evaluating to YES, ADD NEW SITE ADDRESS <223> having functioned, and INCR. D/L & EXE COUNTERS <224> having incremented the download counter, all being in program <200> in FIG. 15, program <300> is similarly updated by adding duplicate increments to site counter <303> in ADD D/L INCR. TO SITE CT. <314>. The site counter is subsequently evaluated to determine whether sites remain to be searched in SITE COUNT>0? <315> following. Should evaluation <315> evaluate to YES, processing loops back to search all appropriately currently stored keyword terms in LOAD SEARCH COUNTER <306> after checking evaluation <304> to determine if at least one site has been downloaded, etc. Should evaluation <315> evaluate to NO, processing ends in RETURN <316>.

## CONCLUSION, RAMIFICATIONS, AND SCOPE OF THE INVENTION

The situation information system has been described with reference to exemplary and preferred embodiments which the reader can see provide a high degree of accessible usefulness which will provide users with better, specifically timely and proximate, information. In addition, embodiments of this system will provide the richness of experience, by allowing users to participate in socially interactive settings, and capability, in conducting business and commerce in proximity to merchandise which is immediately

available, not possible with the Internet's remoteness and lack of physicality. It must be remembered that the descriptions herein, including the program flow charts, are static representations of dynamic systems capable of performing entirely new functions.

While the situation information system contains many specific elements, these elements should not be construed as limiting its scope. Many other variations are possible. For example, an embodiment of the situation information system could employ various means for generating and providing location information including a mix of satellite positioning system and transponding methods using many different gating-pulse signal sources. Also, an embodiment of the situation information device could include a withdrawably stored keyboard or hinged case element with integral keyboard or a video camera could take the place of the camera in the handset or such peripheral devices could be varied in their arrangement, as examples.

Accordingly, various other substitutions, modifications, changes, and omissions may be made in the design and arrangement of the elements without departing from the spirit of the invention as expressed in the appended claims.

I claim:

1. A scalable, openly accessible, dispatcher obviating, situation information system comprising:

a. mobile computers with radios severally operated by users substantially transmitting information including location data, receiving situation information of selectable execution, including audible, visual, and tactile execution, and continually receiving telephone numbers of diverse providers of services and merchandise while obviating the resulting interference imposed by the obligatory answering of a ringing telephone as automated updates occur, and conducting shopping functions in shopping areas including stores and malls,

b. radio locating means by which, from said location data including triangulation systems installed within and among buildings, the location of each of said mobile computers is determined and processed into location information including information pertaining to, and derivable from, the change in location of each of said mobile computers, and

c. one or more radio sources of said situation information, including said location information, proximate information and other information, for purposes including presenting entertainment, commercial offers, and advertising whereby users of said mobile computers with radios benefit from timely information pertaining to situations within their locus.

2. The system of claim 1 wherein said situation information, substantially organized according to said shopping areas and to the power level of radio transmission, and said outgoing information, including mappable hypertext items, pop-up messages, and icons, selectably relate to the area of each of said mobile computers whereby said users of computers are selectably interactively and reciprocatively provided with descriptive information about objects, people, and events within said area of any of said mobile computers.

3. The system of claim 2 wherein said user information and said other information includes communication with others of said users of said mobile computers and said sources and information pertaining to a search of said radio sources, including commercial offers of goods and services and user identification and credit-related information pertinent to commercial agreements whereby individuals among said users of said mobile computers can locate others of said mobile computer with radios and topical events, people, products, and services and arrange for payment and fulfillment of commerce efficiently.

4. The system of claim 3 wherein said user information and said situation information include entertainment information whereby users of said mobile computers can selectably assume fictional identities for purposes of entertainment and recreational games visually, audibly, or tactilely executed selectably within the area of any of said computers.

5. The system of claim 4 wherein said mobile computers with radios include bracket interfacing means to alternatively disconnectably connect to external systems including power supplies for charging batteries of said computers and circuits in buildings and conveyances in the locus of said shopping areas whereby said mobile computers can communicate with other systems including antennas, peripheral devices, and networks by means of wired connections.

6. The system of claim 5 wherein said location data is provided substantially by said mobile computers with radios to said source of said situation information for information about traffic patterns in said areas whereby traffic data are collected automatically by said radio locating means to aid organization of layout, merchandise, displays, and said user access to said area.

7. The system of claim 6 wherein said mobile computers with radios severally include a substantially separate peripheral device holder functioning as an exclusive satellite of, and communicating by means of photonic media solely with, said mobile computer and substantially containing a speaker, microphone, and one or more photon-related devices, including camera, bar-code reader or infrared devices, whereby information associated with use of said devices is processed by said mobile computer to enable said user to operate said peripherals without physical encumbrance due to the obstructive bulk of said computer, exposure to potentially harmful radiation affects associated with close operation of said radio of said computer, or being prevented from engaging in voice communications simultaneously with the viewing of said visual data appearing on the screen of said computer.

8. A method for conducting shopping functions in shopping areas including stores and malls wherein information is communicated wirelessly by providers of services and merchandise, including offers pertaining to the buying and selling of said services and merchandise, to potential customers severally using mobile computers with radios substantially continually receiving telephone numbers of said providers and obviating the resulting interference imposed by the obligatory answering of a ringing telephone as automated updates occur, comprising the steps of:

a. acting substantially simultaneously with receipt of a gating pulse from a transmitter, transmitting customer information, including identification and location information, severally by said mobile computers with radios, and receiving said identification and location information in said situation information system,

b. ascertaining subsequently whether said location information of a selected subset of said mobile computers with radios indicates said computers suitably proximate to said offers, or display thereof, presented by said providers, and

c. transmitting one or more said offers including by visual, aural, and other data types and other pertinent information, severally to said subset of said mobile computers with radios according to said customers' selections and contingently dependent on subsequent actions of said customers whereby said customers using

said computers with radios can shop more knowledgeably and efficiently.

9. The method of claim 8 wherein said actions of said customers include severally making responses to appropriate offers and subsequently communicating using said mobile computer with radios each of said responses, including bids, counter offers, and purchasing and credit information, to said situation information system associated with providers whereby mutually beneficial commerce is securely and easily conducted.

10. The method of claim 9 wherein said customer information includes data further processed by means selected from the group consisting of options and filters whereby said customers severally receive information, including goods and services information, appropriate to the requirements of said customers.

11. A method of communicatively executing, including making apparent to the aural and tactile senses of the user, one or more transmittable mappable hypertext items representing people, organisms, and objects, including buildings, roads, vehicles, and signs, on a computer in a manner scalably representing interrelationships of said objects, comprising the steps of:

a. searching each of one or more unique mappable information code sequences, each of which said code sequences serving to uniquely represent one of said items and copied from the memory of said computer or received from an alternate source, for a field containing geographical coordinates, said each of said code sequences includes an item reference field, a name field, a location field including said geographical coordinates, and a data field,

b. converting said coordinates to an appropriately proportionate representation on said computer, and

c. displaying selectably scalably said items on said computer whereby said user may quickly receive and display timely situation information mapped in the context of spatial information, including appropriate to a geographical or other area, in which said mappable hypertext items are quickly received, mapped, and optionally executably selected by said user to provide additional of said situation information or received, stored, and transmitted by a provider of said situation information.

12. The method in claim 11 wherein said interrelationships of said objects are distance quantities separating each of said objects and are represented by mappable hypertext items processed and selectably represented on said computer whereby time and distance to or between objects may be determined and delimited in order to cause additional information to be executed on said computer from sources, including memory and said service provider, and increase the efficiency of said user thereby.

13. The method in claim 12 wherein said mappable hypertext items include a user modifiable location symbol, including providing dynamic characteristics, whereby said user may choose representation by a unique icon on said computer which can be made to execute on others of said computers.

14. A method of receiving in a mobile computer substantially moving relative to locations of timely interest to the user of said computer, including one or more sources of transmitted digital information describing said locations including services and resources currently available at said locations from one or more selectable visit lists of said sources of said information capable of being organized according to said locations' proximity, timeliness, and other criteria into the memory of said computer, substantially continually receiving telephone numbers of providers of said services and resources and obviating the resulting interference imposed by the obligatory answering of a ringing telephone as automated updates occur, comprising the steps of:

a. executing information from a selectably precedent source of said digital information on said mobile computer, including being viewed on a display,

b. receiving substantially simultaneously information from subsequently selected of the remaining of said sources of said digital information from said organizable sources on said lists, and

c. storing said information from said sources in a retrievable manner in said mobile computer memory for execution selectably alternatively and timely, including preemptively or subsequently, to said information from any of said sources whereby time-critical, location-dependent information transmitted comparatively slowly from multiple sources of said digital information can be received by a traveler using said mobile computer in a timely way while information currently executing is utilized.

15. The method of claim 14 including a keyword search wherein proximate, timely, or desirable sources of said digital information in which keyword terms are found are selectably added to said visit list whereby a user may selectably initiate and alter searches for specific keywords on topics potentially useful to said user, including roadside service locations and other searches, while substantially utilizing said digital information executing on said computer.

* * * * *

US005806005A

# United States Patent [19]

Hull et al.

[11] Patent Number: 5,806,005

[45] Date of Patent: Sep. 8, 1998

[54] **WIRELESS IMAGE TRANSFER FROM A DIGITAL STILL VIDEO CAMERA TO A NETWORKED COMPUTER**

[75] Inventors: **Jonathan J. Hull**, Cupertino; **John F. Cullen**, Redwood City, both of Calif.

[73] Assignees: **Ricoh Company, Ltd.**, Tokyo, Japan; **Ricoh Corporation**, Menlo Park, Calif.

[21] Appl. No.: **644,349**

[22] Filed: **May 10, 1996**

[51] **Int. Cl.**[6] ..... **H04M 11/00**

[52] **U.S. Cl.** ..... **455/566**; 348/17

[58] **Field of Search** ..... 379/59; 348/12, 348/13, 14, 15, 17, 222, 552; 455/33.1, 408, 566, 418, 419

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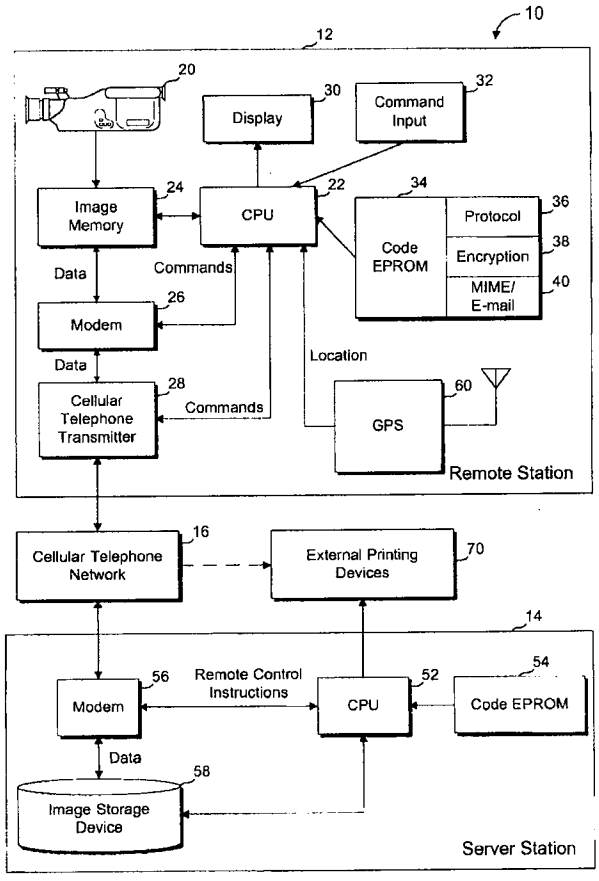
*Primary Examiner*—Dwayne Bost
*Assistant Examiner*—Myran K. Wyche
*Attorney, Agent, or Firm*—Philip H. Albert; Townsend and Towsend and Crew LLP

[57] **ABSTRACT**

A portable image transfer system includes a digital still camera which captures images in digital form and stores the images in a camera memory, a cellular telephone transmitter, and a central processing unit (CPU). The CPU controls the camera memory to cause it to output data representing an image and the CPU controls the cellular telephone transmitter to cause a cellular telephone to transmit the data received from the camera memory. A receiving station is coupled to the cellular telephone transmitter by a cellular network to receive image data and store the images.

**13 Claims, 1 Drawing Sheet**



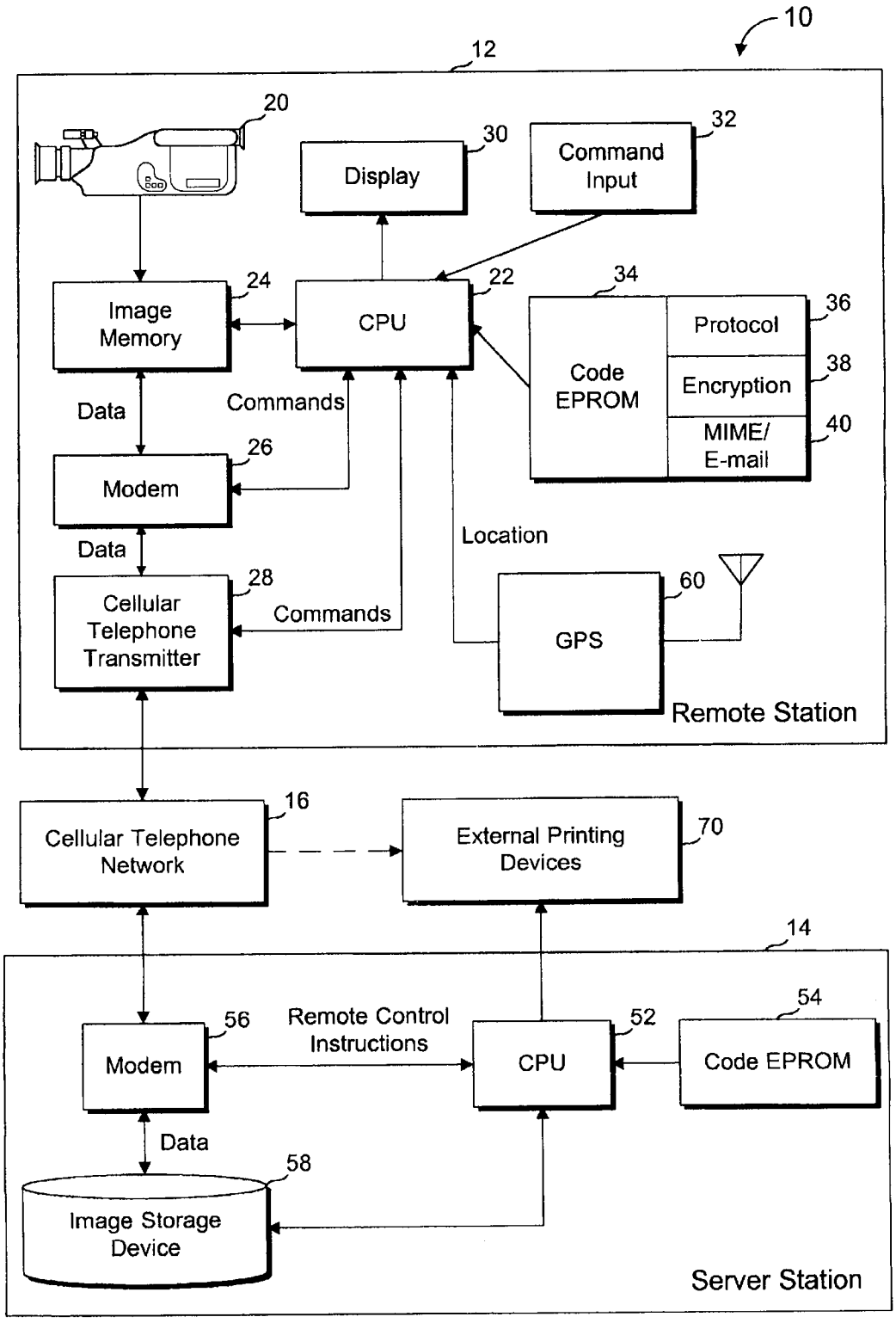

10
12
20
30
Display
32
Command Input
24
Image Memory
22
CPU
34
Code EPROM
Protocol
36
Encryption
38
MIME/ E-mail
40
Data
Commands
26
Modem
Data
28
Cellular Telephone Transmitter
Commands
Location
60
GPS
Remote Station
16
Cellular Telephone Network
External Printing Devices
70
14
56
Modem
Remote Control Instructions
52
CPU
54
Code EPROM
Data
58
Image Storage Device
Server Station

Fig. 1

# WIRELESS IMAGE TRANSFER FROM A DIGITAL STILL VIDEO CAMERA TO A NETWORKED COMPUTER

## BACKGROUND OF THE INVENTION

The present invention relates to the field of digital still video cameras (DSVC's). More specifically, one embodiment of the present invention provides for improved storage of images generated by a DSVC. A portable DSVC is convenient for taking pictures at various locations because of the camera's size and weight. Unfortunately, as users have come to expect small weights and compact sizes for consumer electronics, DSVC's have tended to be limited in the number of images which could be stored. One solution to the problem is to add additional memory modules, but this is an expensive solution given that the memory modules must be miniaturized so as not to adversely affect the portability of the DSVC.

What is needed is a DSVC with a large image storage capacity where the image storage is not unduly expensive and does not unreasonably impact the size of the portable camera.

## SUMMARY OF THE INVENTION

An improved portable image capture system is provided by virtue of the present invention. In one embodiment, a central processing unit (CPU), a modem and a cellular telephone transmitter are coupled to an image memory of a DSVC. The CPU is also coupled to a display and a command input device, which might be a voice activated device or a touch screen device integrated with the display. The CPU executes programs as needed to download images through the cellular telephone transmitter to a server station according to a protocol optimized for the connection available. Where the connection is a direct cellular telephone line, data is sent through the cellular telephone transmitter to cellular telephone system and it is received by a modem at the server station. A CPU at the server station directs the file to be stored in a data storage device, which is typically a large-capacity, inexpensive device such as a hard drive.

In variations of the present invention, the server station might perform complex analysis of the received images in order to instruct the DSVC to obtain additional images which the server station determines are needed for the analyses. The analyses include image resolution enhancement, stereoscopic matching, photocopying, and the like, as well as subjective evaluation of camera angle and image compression. In a specific implementation, the server station transmits images back to the remote station for viewing or forwarding to a local facsimile device or digital camera.

A further understanding of the nature and advantages of the inventions herein may be realized by reference to the remaining portion of the specification and the attached drawing.

## BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a block diagram of a remote station according to the present invention coupled to a server station via a cellular telephone system.

## DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to FIG. **1**, a image transfer system **10** is shown with a remote station **12** coupled to a server station **14** via a cellular telephone system **16**. Remote station **12** includes a digital camera made up of a capture device **20** and an image memory **24**. Image memory **24** is a memory configured to hold a small number of images captured by capture device **20**. In some embodiments, capture device **20** and image memory **24** are provided by a conventional digital still video camera, such as the Ricoh RDC-1 still video camera supplied by Ricoh Company, Ltd. of Tokyo Japan. Whether an existing DSVC is used or the camera is integrated, a CPU **22** is coupled to image memory **24**, a modem **26** and a cellular telephone transmitter **28**. The coupling between the various elements is such that CPU **22** can control image memory **24** to transfer data representing an image from image memory **24** to modem **26**, which converts the image data into a signal suitable for transmission over a telephone line. Modem **26** is coupled to provide that signal to cellular telephone transmitter **28**, which transmits the signal through cellular system **16** to modem **56** of server station **14**.

Remote station **12** also includes a display **30** and a command input device **32** for interacting with the user of remote station **12** and accepting commands. The programs executed by CPU **22** are stored in a code EPROM **34** which respond to the commands sent by a user using input command device **32**. Command input device **32** might be a voice activated device or a touch screen integrated with display **30**. Code EPROM **34** includes code necessary to perform certain processing functions on an image before it is transmitted, such as a protocol packetizing program **36**, an encryption module **38** and an e-mail handler **40**.

Server station **14** is shown comprising modem **56** which is controlled by a CPU **52** which executes code stored in its own code EPROM **54**. The programs stored in code EPROM **54** are instructions for CPU **52** to transfer data received by modem **56** into data storage device **58** while processing the received image to handle the requirements of the protocols used to send the image.

In one example of the operation of image transfer system **10**, CPU **22** executes a program with instructions to periodically read an image from image memory **24** and mark the image as being read, allowing image memory **24** to be overwritten by subsequent images. As each image is read, the image data is encrypted and formatted as an electronic mail message. Where cellular system **16** is not a direct modem link, but a SLIP/PPP connection using TCP/IP, additional protocol packaging is performed on the image for transmission. When the images are received at server station **14**, they are decrypted and unpackaged, then stored in data storage **58**. If desired, some or all of the images in data storage **58** can be made available over the Internet. If a TCP/IP connection is used, CPU **20** might also execute a routine stored in code EPROM **34** to "ping" a destination before sending an image. The ping process sends a dummy message through a channel to determine whether or not the destination, such as server station **14**, is available, ready and willing to receive data. If an affirmative response to the ping is received by remote station **12**, only then does CPU **22** transmit the image package. If location information is to be included with each image, a Global Positioning System (GPS) receiver **60** can be coupled to CPU **22**, such as a PCMCIA-compatible GPS receiver manufactured by Trimble Navigation of Sunnyvale, Calif.

Many uses of the present invention are contemplated, some of which are mentioned here, others of which are apparent after reading the disclosure. One use is the collection of vacation photos. Since the remote station is extremely portable, it is convenient for a vacationer to pack

the remote station and carry it on their travels. When the capture of an image is desired, the vacationer activates remote station **12** using command input device **32**, captures the image and, if image memory **24** is full, transmits images back to server station **14**. This allows the vacationer to take as many pictures as desired without worrying about running out of film or image memory capacity, or needing to carry around sufficient memory to hold all the images from an entire trip.

Another application in television reporting. A field reporter could use the remote station to capture images at the scene of a news event and have those images transmitted to a server station controlled by the television studio, thus allowing up-to-the-minute news photos without requiring expensive and bulky equipment such as is now required in a news van.

In a typical operation, display **30** indicates the amount of free space remaining in image memory **24**. When the user decides to free up additional memory by transmitting images already stored in image memory **24**, the user initiates a command sequence using command input device **32**. This begins the process of CPU **22** dialing a cellular number for server station **14** or otherwise setting up the link between remote station **12** and server station **14**. CPU **22** then packages an image as required by the protocols, encryption or mailing procedures and directs the package as needed and flags the images in image memory **24** as being sent. One method for labeling images as being sent is to include a binary flag for each block of image memory **24** available for images. As an image is captured by capture device **20**, the flag is set to indicate that the block is in use. As an image is transmitted by CPU **22**, the flag is reset to indicate that the block is again available for image storage.

One application in which the present invention finds a use is in-field stereo image capture. With in-field stereo image capture, a camera is on location capturing an image and the server is processing the images. One problem with developing high quality stereo reconstructions is accuracy in image areas where the scene geometry changes quickly, i.e., sharp edges. The need for increased accuracy can be accommodated by capturing more images where needed to increase accuracy. Unfortunately, in the prior art, a photographer would either have to return from a site to process the images to determine if any more images are needed, often necessitating a second trip to the site, or have take the image processing computers to the site. With the present invention, images can be captured and sent to the server for processing with the server interactively responding with requests for the additional images. Thus, the server would process the captured images to determine if a good stereo image can be created. If portions of the stereo image are unacceptable, the server can signal, via the digital still video camera, the photographer to capture additional images.

Face recognition is a similar example. The capture device and the server could cooperate to interactively perform stereo matching, with the server requesting additional captures to improve face recognition. This would overcome the need for subjects to have stereo photographs stored in a laboratory.

Another use of the present invention is to obtain photocopies in locations, such as libraries, where it is not convenient to bring the item to be copied to a photocopy machine. At photocopier resolutions, a single uncompressed page image might require about 15 megabits of memory (1 bit/pixel ×400 dpix×8.5"×11"=1496 mbit). In order to reduce the memory requirements, the image can be compressed at the DSVC, but this requires considerable computation power at the DSVC. With the present invention, a low resolution image (e.g., 100 dpi) can be captured and sent to the server station. The server station then analyzes the low resolution image and identifies all white or black areas of the image as well as boundaries of the areas. To convert to a higher resolution image, the server represents each low resolution pixel with sixteen high resolution pixels. Where the image is all black or all white the high resolution pixels are correctly colored, while the blocks of sixteen high resolution pixels near an edge might not all be one color. To refine these areas, the server station sends image capture instructions to the DSVC instructing it to capture additional information from the edge areas.

Once the image is created at the server station with the desired high resolution, it can be sent to an printer or facsimile machine, typically one located near the user of the DSVC. A user of the DSVC desiring a photocopy could then indicate, using command input **32**, the telephone number of a nearby facsimile machine. The DSVC would then obtain a low resolution image of the page of which a hard copy is desired, and send a low resolution image to server station **14**. Server station **14** then determines the areas of the image for which additional information is needed. Server station **14** communicates the locations of those areas on the image and the DSVC recaptures those areas of the image. The increased resolution required for the high resolution image can be obtained by using a higher resolution lens on the DSVC, or simply capturing multiple images at low resolution and averaging. The resulting image can be compressed by server station **14** if the printing device is a facsimile machine, so that server station **14** need only transmit a compressed facsimile file. Alternatively, server station **14** can retransmit the compressed file to remote station **12**, which would then dial the facsimile machine directly through cellular telephone network **16**.

In FIG. **1**, CPU **52** is shown connected to external printing devices **70**, which could be facsimile machines, printers, or digital copiers. Other variations include the external printing devices **70** coupled to cellular telephone network **16**, especially in the case of the external printing device being a facsimile machine. External printing device **70** might also be coupled directly to remote station **12**. If the size and weight of remote station **12** is not too constrained, a printer might be included thereon. If desired, remote station **12** can be configured to display the captured image on display **30** or in a viewfinder of camera **20**.

Yet another application is stereoscopic matching. Suppose remote station **12** is carried by a geologist who is backpacking to a remote region and desires to capture three-dimensional (3D) images of a landscape. Stereoscopic images are formed from two images of one scene taken at slight offset of each other. In many stereoscopic systems, the precise relative position of the camera between the two images is needed. However, it is now possible to perform stereographic "matching" (alignment of the two images to create the 3D effect) without alignment information. One such system is the C3D technology sold by The Turing Institute of Glasgow, Scotland. Combining that system with the present invention, the geologist could upload the dual images and have a C3D system at the server station immediately evaluate the images to determine if a lock on a 3D image can be made. If not, the server station sends a message to the geologist to reposition the camera and recapture an image, thus avoiding a second trip to the site for image capture.

The above description is illustrative and not restrictive. Many variations of the invention will become apparent to

those skilled in the art upon review of this disclosure. For example, the server station **14** can be either a stationary system or a semi-portable system, so long as it need not be as portable as remote station **12**. Also, the remote station **12** might be controlled from server station **14** by allowing remote station **12** to receive command messages from server station **14** over cellular system **16**. The scope of the invention should, therefore, be determined not with reference to the above description, but instead should be determined with reference to the appended claims along with their full scope of equivalents.

What is claimed is:

**1**. A portable image transfer system comprising:

a digital still camera, at a remote station, which captures images in digital form and stores the images in a camera memory;

a cellular telephone transmitter;

a central processing unit (CPU) coupled to the camera memory and the cellular telephone transmitter, wherein the CPU controls the camera memory to cause it to output data representing an image and the CPU controls the cellular telephone transmitter to cause a cellular telephone to transmit the data output from the camera memory;

a receiving station coupled to the cellular telephone transmitter by a cellular network to receive image data;

means, at the receiving station, for image processing;

means for resetting the camera memory to be reused for subsequent images once an image is transmitted to the receiving station;

a return link for sending commands from the receiving station to the CPU, wherein the commands are directions for obtaining further images as needed by the means for image processing; and

an image storage device coupled to the receiving station to store images received by the receiving station.

**2**. The apparatus of claim **1**, wherein the CPU interfaces to a camera memory of an existing digital still camera.

**3**. The apparatus of claim **1**, wherein the cellular telephone transmitter comprises:

a standard cellular telephone; and

a cellular modem.

**4**. The apparatus of claim **1**, further comprising means for packaging images as electronic mail messages prior to transmission by the cellular telephone transmitter.

**5**. The apparatus of claim **1**, further comprising means for handling a serial line interface protocol connection between the cellular telephone transmitter and the receiving station.

**6**. The apparatus of claim **1**, further comprising means for encrypting image data prior to transmission by the cellular telephone transmitter.

**7**. The apparatus of claim **1**, further comprising a means for causing the digital still camera to capture images on a periodic basis, wherein the CPU is progammed to periodically transmit an image to free the camera memory for accepting subsequent images.

**8**. The apparatus of claim **1**, further comprising means for determining a location of the portable image transfer system and means for including a location indication with each image.

**9**. The apparatus of claim **1**, wherein the commands represent user directions to be displayed at the remote station directing the user to capture additional images as needed by the means for image processing.

**10**. The apparatus of claim **1**, wherein the commands are directions directed at the remote station directing the digital still camera or CPU to capture additional image data as needed by the means for image processing.

**11**. The apparatus of claim **1**, further comprising a remote printing device for printing images processed by the receiving station.

**12**. The apparatus of claim **11**, wherein the remote printing device is one of a facsimile machine, a digital copier or a printer.

**13**. The apparatus of claim **8**, further comprising means, within the receiving station, for using the location indication as a variable when processing said each image.

* * * * *

US006055514A

# United States Patent [19]

Wren

[11] Patent Number: 6,055,514

[45] Date of Patent: Apr. 25, 2000

[54] **SYSTEM FOR MARKETING FOODS AND SERVICES UTILIZING COMPUTERIZED CENTRALAND REMOTE FACILITIES**

[76] Inventor: **Stephen Corey Wren**, 5421-H Knoll Creek Dr., Hazelwood, Mo. 63042

[21] Appl. No.: **08/668,561**

[22] Filed: **Jun. 21, 1996**

**Related U.S. Application Data**

[63] Continuation-in-part of application No. 08/268,309, Jun. 29, 1994, abandoned, which is a continuation-in-part of application No. 08/264,184, Jun. 22, 1994, abandoned, which is a continuation of application No. 08/051,743, Apr. 22, 1993, abandoned, and a continuation-in-part of application No. 07/855,099, Mar. 20, 1992, abandoned.

[51] **Int. Cl.**[7] ..... **G06F 17/60**

[52] **U.S. Cl.** ..... **705/27**; 705/26; 705/36

[58] **Field of Search** ..... 705/10, 26–28, 705/35, 37; 379/93.01, 93.06; 345/329–332; 395/200.3

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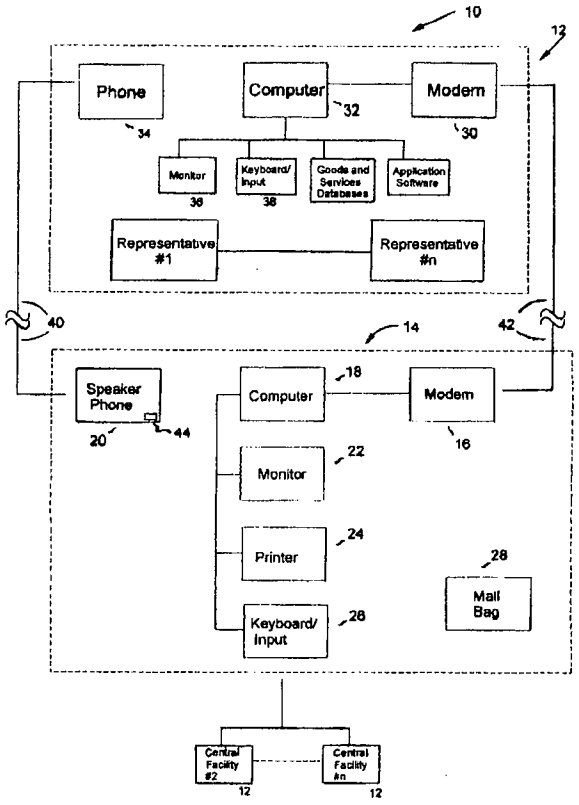
*Primary Examiner*—Allen R. Macdonald
*Assistant Examiner*—Hani M. Kazimi
*Attorney, Agent, or Firm*—Norman L. Wilson Jr

[57] **ABSTRACT**

A system for shopping for goods and services includes central communications facilities and remote communications facilities connected by communications links and permitting data communications between them. Central communications facilities offer goods and services in competition with each other. Each central communications facility stores, in addition to data, graphics in the form of video, and audio in the form of computerized voice and music. Computer input devices at each remote communications facility permit customers to access the data, graphics and audio. Computers at each remote communications facility also enable that facility to receive and download the data, graphics, and audio. Each remote communications facility is adapted to enable a customer, after viewing the data, graphics, and audio, to electronically negotiate a price for the purchase of the goods and services. Each central communications facility can generate and transmit to the remote facility transaction specific paperwork relative to the price so negotiated.

**5 Claims, 1 Drawing Sheet**



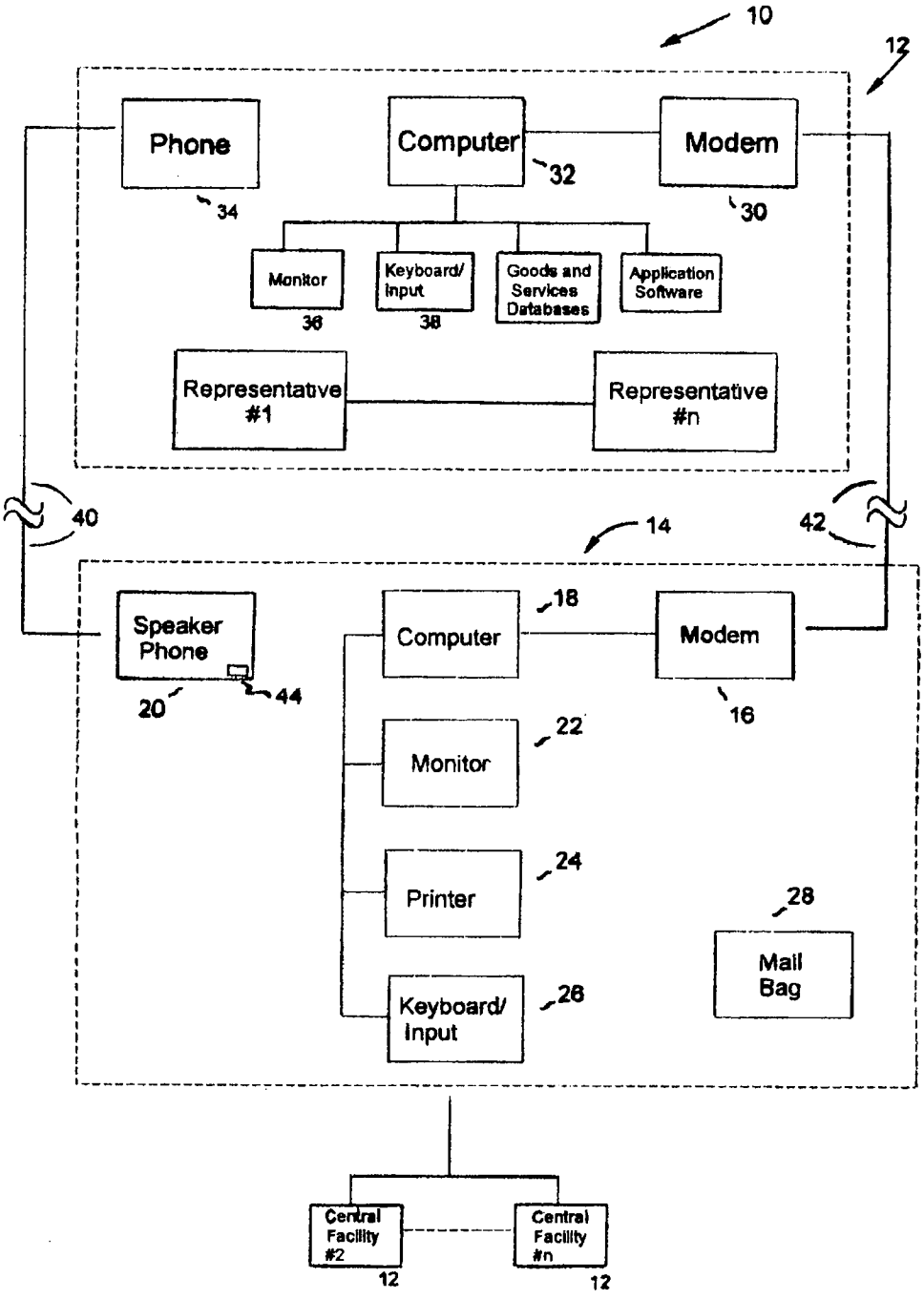

10
12
Phone
34
Computer
32
Modem
30
Monitor
36
Keyboard/ Input
38
Goods and Services Databases
Application Software
Representative #1
Representative #n
40
42
14
Speaker Phone
20
44
Computer
18
Modem
16
Monitor
22
Printer
24
Keyboard/ Input
26
28
Mail Bag
Central Facility #2
12
Central Facility #n
12

Fig. 1

# SYSTEM FOR MARKETING FOODS AND SERVICES UTILIZING COMPUTERIZED CENTRALAND REMOTE FACILITIES

## CROSS REFERENCE TO RELATED APPLICATIONS

This application is a continuation-in-part of U.S. application Ser. No. 08/268,309, filed Jun. 29, 1994, now abandoned which is a continuation-in-part of application Ser. No. 08/264,184, filed Jun. 22, 1994, now abandoned which in turn was a continuation of application Ser. No. 08/051,743, filed Apr. 22, 1993 now abandoned. Application Ser. No. 08/051,743 was itself a continuation-in-part of Ser. No. 07/855,099, filed Mar. 20, 1992, now abandoned all of which are incorporated herein by reference. The application herein is copending with Ser. No. 08/650,834, filed May 20, 1996 pending which is also a continuation-in-part of U.S. application Ser. No. 08/268,309, filed Jun. 29, 1994 now abandoned.

## FIELD OF THE INVENTION

The present invention generally relates to a system and means for establishing a communicating link between remote facilities. More particularly, the invention is concerned with a system and means for facilitating transactions between central and remote facilities utilizing electronic communications devices and computing equipment for concurrently or nonconcurrently transmitting voice, music, audio, data, images, video, and optic information on goods and services, and/or signals. Such systems will be used to market, sell, finance, and insure goods and/or services.

## DESCRIPTION OF THE PRIOR ART

Over the years the marketing of certain financial services and in general of all goods and services to retail customers, such as auto financing to car purchasers at car dealerships, has increasingly been hindered by problems experienced by the companies providing the financial services. In fact these difficulties extend to all providers of goods and services in reaching their customers. The more serious of these problems are high administrative costs, long delays in creating and implementing new financial service products, and complex methods which confound and confuse retail sales locations and their customers.

The traditional approach in marketing financial service products has been to offer them at retail sales locations by employees of the retail businesses acting as agents of the financial services companies. One of the consequences of this traditional approach is that each retail sales business is required to have the necessary means for calculating or computing and quoting rather complicated matters, such as payments and premiums, and to be responsible for maintaining computer hardware and software systems independently of and in addition to that at the financial service companies. All too frequently these requirements result in contracts written with wrong amounts and/or terms which later create embarrassment and confusion for the retail sales business when those contracts have to be amended, endorsed, or worse yet completely rejected.

Another consequence of this traditional approach is that in acting as agents of the financial services companies, the employees of the retail sales businesses are often required to be licensed in their state to do so. High turnover rate of these employees can pose a serious problem for these businesses as personnel with such skills are not easy to find.



Furthermore, there are considerable costs for the retail sales businesses in maintaining separately these in-house systems or replacing them to keep pace with changing products and regulations.

An ideal system for providing these financial services is one which overcomes the above-described problems of the traditional approach. Such ideal system will employ the qualified agents or representatives available at the financial services company and its centrally located computer hardware, software, and product information and thereby eliminate the necessity for employees of the local retail sales business to qualify to act as agents of the financial services company. Elimination of local agents will reduce the incidence of contracts containing errors and save the cost of training such employees. Also, such ideal system will utilize the hardware and software existing at the central financial services company comprising all desirable product information and thereby eliminate the necessity to purchase and maintain at each remote location the hardware and software necessary to process and support the activities of such otherwise remotely located employee agents. Further, such ideal system will employ the expertise of agents at the financial services company and generate the appropriate financial services documents tailored to the particular customer and thereby eliminate the necessity to obtain and maintain the instructional manuals and application forms necessary for carrying out of these activities at each remote location.

The prior patent art reveals two remote transaction systems whose stated objective is to reduce overhead expenses. These remote transaction systems should be considered as possible candidates for offering solutions to the aforementioned problems experienced with the traditional approach of providing financial services.

One such system disclosed in U.S. Pat. No. 5,231,571 to D'Agostino provides a method of offering financial service products to customers at remote locations by way of representatives at a central location. Accordingly product information is displayed at the customer's terminal as the customer and representative converse.

However, the D'Agostino method requires that the information to be displayed the customer be stored in the computer at the remote facility unlike the preferred embodiment of the present invention where the information is centralized or stored centrally and thereafter transmitted to the customer at the remote location, making it difficult to correct or modify the information thus shown to customers. Also in storing the information to be displayed to each customer remotely each representative will be required to be licensed to sell such products in each state he might assist a customer and therefore significantly increase the number of required representatives otherwise necessary. In this manner the preferred embodiment of the present invention where such information about goods and services is stored at the central facility can reduce the licensing requirements of the representatives and thus the number of representatives required.

Further D'Agostino relies upon static or still motion images of the representative as displayed to the customer and stored remotely causing a constant need for changes of that information created by turnover of representative staff, unlike the present invention which can store such information centrally or as in another embodiment permit 2way full motion color video images or video conferencing thus eliminating the need of storing any such image, remotely or centrally. In relying upon still motion images of his representatives he has most of all greatly limited the effectiveness

of his system as a selling tool as recently 2way full motion video has been proven to greatly and unexpectedly increase product sales offered through such systems or methods such as described in the March 1993 issue of The Banker on page 61. Nor has his method provided the customer an input means thereby chaining the customer to the representative thus giving him no freedom in reviewing product information on his own without the help of the representative as the customer can with the present invention. He has to the contrary demonstrably taught against the use of the keyboard as a means of input by the customer at the remote facility and has not provided for any further means of customer input.

Also in not permitting the storing of product information other than remotely he has created a captive situation for remote users permitting them to only use the goods and services of a single provider whereas the present invention will with central storage permit each remote facility or location to communicate with an array of central facilities, sort of a public telephone. Thus at best, the D'Agostino method leads to less than an optimum solution to the problems noted heretofore with the traditional approach to marketing financial service products and all other goods and services.

Previous art in the field limited use of a given customer facility to a single provider. In the present invention it is contemplated that customers can use the remote facility devices to contact multiple providers of goods and services. There are 2 advantages to this aspect. The first is that in permitting remote locations to communicate with multiple central facilities, providers are able to share the costs of the remote facility equipment. Previously the cost of the equipment at the remote location was prohibitive so that the system's use was impractical for all but a few select applications.

The second advantage is the greater number and selection of goods and services available to customers. Since providers will be able to share the cost of the remote equipment more providers will be encouraged to participate and an even greater variety of products will be offered. The difference between the present invention and the prior art therefore is comparable to a grocery store with only one brand of soft drink as opposed to an aisle with an assortment of beverages. The reduction of expense for each provider will thereby encourage providers to use these systems as a low cost means of providing for the marketing and sales of their products to the public. These savings can in turn be passed along to their customers. Multiple companies can then share the expense of the equipment at the remote location. This method also as above improves the competition for the products offered at the remote location, breaking the monopolistic model of the previous art.

Another remote transaction system disclosed in U.S. Pat. No. 4,845,636 to Walker provides a transaction booth located remotely from an operations center for facilitating a transaction such as the renting of an automobile. The booth and center were connected by audio and video equipment used for transmitting audio and video signals from the customer in the booth to the agent at the operations center in order to negotiate a transaction. The customer in this instance knew what he wanted. He was not shopping, but merely seeking to effect a predetermined transaction.

However, the Walker remote transaction system has no means for producing a financial services document or contract at the booth tailored to the specific needs of the customer, nor does it utilize 2way full motion video thereby severely limiting its applications and efficacy by not providing the remote user full motion images such as of the agent or of what might be described as full motion commercials. The present invention furthermore represents a new use as Walker did not anticipate the sale of financing and insurance by any such system nor could he have used his for such. Walker as well fails to provide the user at the remote facility a means of input and as a result as with D'Agostino chains the customer to the representative.

Neither does Walker permit each remote facility to communicate with a variety of central facilities thus restricting the variety and competition for goods and services there offered and has therefor himself created a monopoly. Thus at best, the Walker system leads to less than an optimum solution to the problems noted heretofore with the traditional approach to marketing financial service products.

Consequently, a need still exists for new and improved systems which facilitate consummation of business transactions utilizing central and remote facilities or locations.

## OBJECTS OF THE INVENTION

An object of this invention is to provide a system and method for facilitating transactions utilizing central and remote facilities or locations which satisfies the aforementioned needs.

Another object of the invention is to facilitate transactions by customers at remote locations, for instance, car, truck, boat and motorcycle dealerships, department stores, public locations such as shopping malls, auction houses, airports, grocery stores, and real estate offices.

Another object of the present invention is to further centralize and simplify the responsibilities over these products.

A further object of the present invention is to shorten the time required to create and implement new products in the financial services arena and all others.

An additional object is to provide a wider variety of products to offer customers.

## SUMMARY OF THE INVENTION

The system for marketing goods and services herein includes a customer computerized communications facility, a central computerized communications facility remote therefrom, and a data link between them. This invention is an improvement in that system which includes: computer means at both the customer computerized communications facility and the central computerized communications facility, adapted to transmit and receive images and data between them; means for additionally establishing voice contact between the two communications facilities; software stored at the central computerized communications facility adapted to provide goods and services information; input means at the customer computerized communications facility adapted to enable a type of customer who is uneasy using a computer to access that software in order to view a presentation adapted to educate the customer about the goods and services; input means adapted to enable a type of customer enjoying computers to access the software in order to bypass the presentation, and, in a self-service mode, to browse in the software to view desired information to learn about goods and services at his desired level of knowledge; means enabling both types of customers at any time they desire personal assistance to utilize the means establishing voice contact to talk to a representative at the central computerized communications facility; application software

located at the central computerized communications facility enabling either type of customer to download from the central facility to the customer computerized communications facility information desired by the customer; and input means located at the customer computerized communications facility enabling the customer to access application software located at the central computerized communications facility.

Further, the information regarding the goods and services obtained by the customer includes accompanying voice narration.

The input means at the customer computerized facility and the application software at the central computerized facility enable customers to search for goods according to model, manufacturer, and marketer of the goods.

The input means at the customer computerized facility and the application software at the central computerized facility enable customers to search for a predetermined selection of goods.

The application software at the central computerized facility enables the customer to download instruments finalizing a transaction relative to the goods and services.

The application software at the central computerized facility includes a subroutine for charging customers for their use of personal assistance.

The application software at the central computerized facility includes a subroutine for charging customers for each instance a customer is shown product information.

The application software at the central computerized facility includes a subroutine requiring customers to view a specified amount of product information in return for being granted a specified amount of use of the system.

The application software at the central computerized facility includes a subroutine providing the customer an electronic phone book containing a directory of providers and goods available.

The application software at the central computerized facility includes a subroutine which builds a general customer profile based upon customer's requests for information.

The application software at the central computerized facility includes a subroutine permitting a plurality of customers at different computerized locations to view simultaneously the same presentation and to speak to each other during said presentation, the presentation being under the control of one of the customers.

Means are provided for control of the system to alternate between the individuals so that at times a first customer can control the presentation while at another time a second or other customer can assume control.

The central facility is a service company representing the provider of the goods or services.

A representative is located at the central computerized facility and that representative is an agent for the provider of the goods and services.

The customer computerized communications facility includes means for communicating with a number of different central computerized communications facilities.

The system wherein one facility is a retail sales store, and the other facility is a banking institution.

The system wherein one facility is an automobile company and the other facility is a bank.

The improved system wherein the central facilities are auction houses.

The system also includes means enabling a customer to speak with a representative at each facility.

## THE INVENTION

The prior art fails to recognize that some individuals love to use computers, while others are intimidated by them. This invention provides for both types of customers.

Another problem is they failed to recognize that the public they were dealing with is a generation accustomed to television. Traditional computer methods typically applied towards back office accounting functions by large computer organizations such as IBM, Univac, and Honeywell where users peered blurry eyed into cathode ray tubes are not compelling when applied toward commerce. Customers were not accustomed to having to read large amounts of text and would not accept that approach. This failure on their part greatly explains their poor results and why the public refused to accept their antiquated methods. To correct those earlier failures the present invention uses the computing devices to transmit presentations of goods and services including text, graphics, voice, audio, music, images, and video.

The use of computerized voice is significant. The prior art is limited generally to transmitting only text and perhaps a few graphics, requiring that the customer read a great amount of text to get the information they wanted. In contrast, the system of the present invention understands these preferences and has adjusted the system accordingly to accommodate the present generation.

A disadvantage of text is its limited ability to convey enthusiasm, emotion, and in general meaning. There is much contained in human speech in terms of inflection, tone, and volume which convey a significant part of the idea intended. Consider that a particular sentence can when spoken one way be a compliment, yet when spoken with different inflection it becomes an insult. As illustrated, text seldom conveys these colorful aspects of speech and can never succinctly convey a complex thought or idea entirely. Even worse results can be obtained when translating from one language to another. Text only approximates speech. It does not replace it as the forerunners of these systems assumed. For this reason this system's use of computerized voice provides surprising and superior results.

This invention provides a system where customers can shop for homes and obtain financing all in one place, computer stores, homes, factories, office buildings, and from all public and private locations from which a consumer or customers want to obtain product information or perform a transaction.

## DETAILED DESCRIPTION OF THE INVENTION

In the case of auction houses a number of the remote locations can be concurrently linked with one or more central facilities or auction houses so that groups of customers at each remote or local auction facility can participate in the actual auction at one or more distant central facilities or houses. In this fashion auction customers throughout the world can participate at local auction houses in auctions taking place throughout the world so that a customer in Saint Louis can participate and bid in an auction concurrently taking place in Hong Kong or France. In this particular embodiment each customer can be provided his own personal input device permitting him to personally enter his bid during the joint auction session and at the conclusion of a successful bid remit his payment. He can as

well be provided a separate monitor or can share a large screen with some or all other attendees. Each customer can be provided a separate recording or printing device to provide the customer a record or receipt of any transaction he performs.

A number of terminals can be grouped to form an electronic shopping store permitting the customer to obtain desired information on the products of his choice while having access to highly knowledgeable representatives and can also record, print or otherwise, selected information for their later review. For this purpose the customer's monitor can display a tool or icon they will use to control the information to be recorded. Remote facilities can even be portable so that for example they can be used at trade shows such as car shows permitting attendees to obtain more specific information about the products they desire and to execute their purchase and obtain financing. The customer is to communicate with central facilities or locations comprising banks, credit unions and finance companies, a service company representing such companies, manufacturer's offices, or in general any location from which a customer might wish assistance in facilitating a transaction. The method by which the transactions are facilitated reduces the costs associated with creating, marketing, administering, and selling these products and services, thereby making them more cost effective and affordable.

By providing that the central facility can be a service company the present invention has departed from the previous art. Typically when marketing their products in a traditional approach a company will use the assistance of a service company rather than directly sell or market their own products. The difficulty with the previous art is that they did not allow for a complement to the traditional marketing approach. In the case of deploying these systems specific corporate capabilities will be required. If companies have not felt comfortable in marketing their own products using long established methods and channels, they most certainly will not feel comfortable in using this system on their own. It is anticipated that many will instead demand the assistance of a third party who is more acquainted with the technologies involved and has developed expertise with them.

The foregoing objects are accomplished by a transaction system and method where having earlier established communication between the remote and central locations the customer can use the electronic communications devices and computing equipment at the remote location to contact a financial services company or some other central facility to facilitate a transaction, such as negotiate the purchase, lease, and contracting of financial services and/or other goods and services. In the preferred embodiment of the present invention a financial services company and its agents who will now be responsible for selling these products to the customers are located centrally and all or substantially all activities of the financial services companies or central facility and its agents are centralized in its state making those products subject at most to the laws of that state or sovereign and thereby drastically reduce or simplify regulatory constraints and streamline related compliance and business costs such as by having only one computer system used to support the selling and administrative process thus eliminating the need to provide this support including applications software at each distributed remote location and in having to train only a single centrally located group of individuals who will act as the agents or representatives.

Previously these financial services companies sold their products through agents located at the site of the customer. The difficulty is that many of the products required that the agents be licensed to sell certain products such as investments and insurance. The difficulty with this is that a significant amount of training and expense was required to place these agents out there. High turnover rate of employees at one location could pose a real problem. The process of getting an agent licensed can itself take a year and each state regulated the licensing of agents within their state. In centralizing the agents we are able to reduce the licensing requirements since agents at the central location can service customers from multiple states so that an agent at a central location say in Missouri could serve customers in theoretically all 50 states. So rather than have 50 different agents each serve a customer in each state we can have one agent serve all 50 customers thereby reducing licensing bottlenecks and related expenses. The reduction in those expenses can then help these firms better manage their business expenses and in turn pass these savings on to their customers.

Although in the preferred embodiment the customer speaks with only one representative at a time it is further anticipated that the customer can speak with multiple representatives from either the remote or central locations at the same time as in a team sales approach. As it is anticipated that customers will speak a variety of languages it will be necessary for presentations and representatives thus provided to be based in the language of the customer; whether it be English, Spanish, French, German, Japanese, or any other desired language. This approach might include utilization of personnel at the remote facility to collectively assist the customer. Also in the preferred embodiment the financial services company or central facility will have no physical presence at the remote facility meaning they can not advertise in any fashion such as on radio, television, or in magazines in the state of the remote facility or by placing or storing product information such as sales materials or literature at the remote facility itself. This will require storing all product information at the central facility so that all activities including product information about these goods and services are then centralized at the central facility.

It should be understood however that certain information can be stored at remote facilities such as directories of facilities for dialing purposes or a data base of providers of goods and services arranged by category of business or products offered such as in the Yellow Pages phone directory. In that sense an electronic phone book can be stored at the remote facility or instead upon pressing or utilizing the touch screen, keyboard or input device the customer can activate the system causing it to retrieve from a central facility a directory of goods and services available and thus permitting the customer to select another central facility from a displayed list or catalogue and establish contact with it and thus have access to numerous central facilities and a myriad of goods and services.

The present invention in utilizing an electronic version of a Yellow Pages has deviated from the prior art in modifying these types of systems to fit with existing shopping patterns of the public. Rather than requiring the public to change their method of shopping for goods and services as the prior art requires, the present invention has adapted to existing modes of shopping. The present invention has anticipated that the public's learned behavior is difficult to break and so has provided that the customer can shop according to existing patterns permitting them to shop by manufacturer, product, or marketer as one might if they were previously shopping for say a tire. In that event a customer can locate that specific tire either by its model name, its manufacturer, or the marketer through which he intends to purchase it. This

approach is akin to a customer shopping through the White or Yellow Pages or by store or in a mall.

Additionally customers can just browse through a selection of goods and services as though they were window shopping. To accomplish this the system can present a collection of products for those customers who do not have any specific need but are rather shopping as entertainment. This might include a group of unique products offered at special prices or terms. These could include limited edition merchandise or closeouts. As demonstrated, rather than requiring the public to adapt itself to a new method as did the prior art, this system has adapted itself to the public and current shopping behaviors.

While in general all or substantially all application software will be located at each central facility, such as programs which will prompt the customer for input, choices, or preferences so that the customer will contact the central facility and then indicate his choices or preferences; it can also be beneficial to download certain software from the central facility to the remote location to provide proper control and support for the customer such as by means of appropriate communications software or operating systems. This provides for the simple updating of any needed communications or other remote located software at the remote facility and ensure that each remote location will be compliant with future standards of communication and protocol based upon changing needs and industry standards. Such downloaded software can be stored temporarily at the remote facility to be used only in the current session or can be retained for all or selected future sessions. It can also be beneficial to quickly download a catalogue of desired or requested information to permit the customer to review leisurely while terminating the communication link to reduce connect charges or free utilization of the central facility's resources. The customer can then reestablish contact with the previous or a new representative and central facility when he is ready. To facilitate such a technique the remote or central location can record the stopping point of the customer's last on-line presentation so that when contact is resumed an appropriate presentation continuing point can be ascertained.

An alternative is to allow the customer to enter any phone number he might wish to dial while accepting a credit card, debit card, or calling card where the customer is to pay or be charged for any phone, connection, or use charges that will be incurred. In this fashion the customer is to be charged for the use of the equipment or transmitting and receiving means. The customer could be charged for any system use or only for their use of an attendant at the central or remote locations should they need assistance. However, it can be necessary or beneficial to not charge new customers for use of live attendants for a select period of time. Thereafter they will be treated as other customers. Otherwise, charging new customers for their use of attendants can discourage them from attempting the system's use. Once we get them accustomed to the system it will be easier to convince them to help themselves.

Alternatively, the customer could be charged for any use, but more when they need human assistance. The benefit of this approach is that in offering live assistance customers are encouraged to use the system. This is sometimes necessary as not all customers will feel comfortable in using what they can perceive as a computer perhaps for fear of feeling or appearing inadequate. Having human assistance available will make these customers feel more secure and therefore willing to try the system. Yet in charging customers for the use of human assistance they are encouraged to help themselves thus permitting greater utilization of the representatives. This is perhaps an adaptation of animal or human behavior enticing the customer to first use the system and thereafter encourage them to help themselves.

As above, the system could thus provide a means to read credit cards and such as by card swipe reader or any other approximate equivalent means and can as well be used to later tender payment for goods and services purchased. In this sense the system could be used as a sort of public telephone to transmit and obtain information about any goods and/or services the customer might desire from any central location anywhere in the world.

A further variation in this theme is to instead charge the providers of goods for listing their products on the system. This could be in the form of a periodic flat fee or the providers could instead be charged for each incidence a customer requests their product information or is shown it involuntarily based on a customer's profile. Different rates can apply depending on whether a customer requests the information or is shown it involuntarily. To improve the reaction of the customer to an involuntary commercial the system might instead at the predetermined time offer a choice of commercials to the customer prompting them to choose which one they have most interest in and wish to see. One choice could even be a random selection if the customer wishes to be surprised.

This response serves two purposes. The first is that in voluntarily choosing which product the customer is to learn about, they are more apt to assume a positive attitude toward that product since they willingly chose it. Second, this selection by the customer could be used to build or update their customer profile.

In a similar fashion as the customer's profile can be used to determine which products they will view in commercials, this profile can also be used to determine which version of a provider's commercial a customer will see. It is a common practice in advertising to alter a commercial according to the demographics of the anticipated viewer. A commercial appearing on a country and western radio station will differ from that appearing on a classical music station. Having a profile for each user will permit advertisers to provide a message custom tailored to each specific customer profile.

To determine its corporate customer profile each provider of goods can use the system. Profiles of those customers who specifically request product information can be used by those providers to build general profiles of those customers who might have an interest or need in their goods. Thereafter those provider profiles can be used to help the system guide commercials to system users most likely to be interested in those goods. Commercials can then be shown to customers intermittently throughout the customer's session or at predetermined points such as when the customer is waiting for live assistance or in between queries.

One approach is to require that each customer watch a specified number of minutes of commercials for a given number of minutes of entertainment programming.

Another approach to commercials is to credit a customer's account for each minute of commercials or product information he views or according to the amount of goods they purchase. In return the customer could be granted so many minutes of entertainment programming. One approach to this is similar to a traditional broadcast strategy where the customer passively sits back and watches assorted programming. Yet at anytime the customer can use an input device to request information on sponsors' products. A list is then presented to the customer of the various sponsors and the

customer could then choose which ones he wants to see a presentation on.

Alternatively, a list of sponsors and their products could be collected from each program watched so that after the program has completed the customer could then review the list of sponsors and choose which commercials they will view. The products and sponsors can be tied into the programming but need not be related. The system could also build a list of chosen sponsors for each customer allowing them to at a later date go back and review the same or additional information on those products. As above a customer is only permitted so many minutes of entertainment programming for each minute of commercials. The result is quite different from present day television as customers are required to actually participate in the selection of the commercials they are to watch and can immediately obtain more specific information on those products they choose. Having made the decision for themselves, it is expected that customers will have more interest in the products of sponsors.

## BRIEF DESCRIPTION OF THE DRAWINGS

In the following detailed description, reference will be made to the attached drawing in which:

FIG. **1** is a block diagram of an array of electronics communications components employed in a system and method for facilitating transactions in accordance with the principles of the present invention.

## DETAILED DESCRIPTION OF THE INVENTION

The preferred embodiment of a system **10** and method for facilitating transactions in accordance with the principles of the present invention will now be described in detail. The transactions facilitating system **10** includes at least one central facility **12**, such as a financial services company, marketer, or manufacturer and at least one remote facility **14**, such as a retail sales facility, or any other public or private location from which a potential customer of the central facility **12** wants assistance in facilitating a transaction. For instance, the remote facility **14** can be retail sales facility, such as car, truck, boat and/or motorcycle dealerships. The central facility **12** can be a financial services facility, such as a bank, credit union or a finance company or any other central facility from which a customer wants assistance in facilitating a transaction.

In the illustrated case of financial services, the system **10** facilitates the carrying out of activities such as financial business transactions in accordance with the principles of the present invention by employing an array of means for transmitting and/or receiving information comprising visual, audio, and/or data between the financial services facility or location **12** and a customer at one of the respective remote facilities or locations **14**. The financial services facility **12** offering the goods and/or services or assistance in facilitating such a transaction is established at a central location. Each retail sales or remote facility **14** is sited at a given remote location where potential customers are located whether stationary or portable. In this respect the system can be used to execute a transaction between the customer and the central facility or it can only provide assistance to the customer in his selection of goods and services which a local or remote facility are to thereafter provide.

At the remote retail sales facility **14** an area is established where an array of electronic communications equipment is provided in accordance with the present invention for transmitting and/or receiving information comprising visual, audio, and data about financial services or other goods and services between the central financial services facility **12** and the customer at the remote facility **14**.

More particularly, as seen in FIG. **1**, such array of electronic communications devices and computing equipment includes a modem **16**, a digital computer **18**, a speaker phone **20** or other means of conveying sounds, a monitor **22** or other means of conveying images, a printer **24** or other means for recording signals or information conveyed from the company **12**, and a keyboard or input device **26**. It is anticipated that a handset rather than a speaker phone or external speaker can be used in instances where a customer wishes to speak privately with a representative.

For an application of this system in homes the input device could be a television remote control device perhaps with alterations comprising cursor movement keys, a joystick, or a microphone for voice input. In recording this product information the customer can then save or take the desired information with him for his later review which might comprise instructions for use, operation, or assembly and can include a list of suggested products or services as advised by the live representative or by the central facility computer. Such information might be recorded on paper, magnetically such as upon a cassette, video tape, computer disc, CD, or a chip embedded or smart card, or by some other means. Comparably the central facility can record the transaction for later retrieval so the customer can continue where he left off at a later date should his interest renew or for identification purposes or for possible assistance in resolving disputes. Other means to verify identification of the customer can be used comprising magnetically encoded badges or cards, or the use of eye or finger scanning devices. Additionally, a mail bag **28** or other means for remitting payment or documents is provided at the remote facility **14**.

For communicating with the customer at the remote retail sales facility **14**, a complementary array of electronic communications devices and computing equipment is located at the financial services facility **12** or central location. As seen in FIG. **1**, this equipment includes a modem **30**, a digital computer **32** or other means for processing information, instructions or data, a phone **34** or other means for voice exchange or audio transmission, a monitor **36** and a keyboard or other input device **38**. Only a complementary printer is not needed at the financial services facility **12** for the purpose of facilitating transactions in accordance with the present invention. Preferably, two separate phone lines **40, 42** are available to interconnect the respective phones **20, 34** of the facilities **14, 12** simultaneously with, but separately from, the interconnection of the respective modems **16, 30** of the facilities **14, 12** so that voice or audio, visual, and data communication can be ongoing concurrently between the customer at the remote facility **14** and an agent at the financial services facility **12**. Alternatively such contact can be established by coaxial cable such as through a cable company or some other means of establishing contact or by means of some wireless technology such as radio. Each of these components of the respective electronics communications equipment at the respective facilities **12, 14** is per se a conventional off-the-shelf item and thus it is not necessary to describe such components in any further detail.

One embodiment could use a combination of wired and wireless technologies. In this instance the information being transmitted to the customer could be on a wireless basis whereas the signals transmitted to the central facility could be on a wired basis. The advantage of this approach is that standard telephone lines can be insufficient at transmitting extensive amounts of video and audio information.

However, the bulk of this type of transmitting will in certain cases be going from the central facility to the customer. But in many instances the demand for transmitting from the customer to the central will be significantly less and will in most cases be adequately handled by normal telephone lines. This approach can then reduce the expense of deploying these systems by reducing or eliminating the need to install a more advanced wired communications network.

At the remote facility **14**, the customer of the retail sales facility **14** and/or of the financial services facility **12**, is escorted to the area where the above-described array of electronics communications equipment of the retail sales facility **14** is provided. The customer presses an auto dial button **44** on the speaker phone **20** or uses his input device such as a touch screen to select a central facility to contact from a list displayed on his monitor and in doing so establishes contact with the financial services company **12** and perhaps its agent by way of some means of transmitting data, audio, and/or visual information comprising telephone or videophone thus permitting the simultaneous or concurrent transmitting of audio, video, and data as the customer and representative speak with one another or establish voice contact and while the representative provides the customer with information about goods and/or services. At that time the customer can automatically review established presentations to better prepare him for a session with a representative and to educate the customer on the goods and services he is about to consider or at the customer's wish he can bypass these introductory presentations and immediately direct the session or request personal assistance from a representative.

As an alternative the customer can establish contact with the central facility's equipment without the assistance of a representative and merely help himself in a self-service mode where he can browse through databases of goods and services. The speaker phone **20** as contemplated herein is intended to encompass other comparable devices, such as a videophone or the like, where in addition to 2-way verbal contact the customer can establish 2-way or 1-way visual contact with the agent. Concurrently or subsequently the remote terminal can transmit its phone number, serial number, or identification code to the central facility so as to identify itself and thus satisfy any future administrative needs of the central facility should for example a break in communications occur and the need arise to reestablish contact with the specific remote facility and its customer. In this respect it will be necessary for each remote location to store this serial, phone, or station identification number for future transmittal.

While in the preferred embodiment the customer at the remote facility initiates contact with the central facility it is contemplated that the central facility or its representative can have occasion to initiate contact with a given remote facility. An example is a public or private location where the central system contacts the remote facility to apprise potential customers of goods and services offered. In a public location such as at a mall a remote terminal can perform for customers who pass and prompt them to press the screen to obtain specific information.

To facilitate reconnection should an accidental break occur in the connection between remote and central facilities, upon each break initiated by a customer a control signal will be transmitted to the central location. Otherwise should any break occur without the central location having just prior received this code the central facility will know to reestablish contact. If the code is received just before the break there will be no need to reconnect as the customer terminated contact. Another approach is to store the presentation stopping point at the customer location so that if accidental break occurs the remote system can reinitiate contact if the customer wishes.

Having established contact the customer and agent then speak with one another by way of the phones **20, 34** of the respective facilities **14, 12**. Concurrently, the agent by using his or her digital computer **32**, monitor **36**, keyboard **38** or other input device and modem **30** establishes electronic contact with the customer's modem **16**, digital computer **18**, monitor **22** and printer **24** if such contact has not already been established by the customer by means of a single telephone or communications line, or wireless means to transmit and provide helpful audio, video, and data information to the customer about the transaction being proposed for the customer by the financial services facility **12**. Such information can take the form of charts and the like displayed on the monitor **22** or printed on a sheet of paper by the printer **24**. It can comprise audio and visual information related to those goods and services of interest to the customer and can contain any desired sales or product information such as product specifications, service data, published articles, product demonstrations, orchestrated presentations, sales literature such as you might find in a brochure or catalogue, possible uses, compatibility, styles, selection, availability, comparisons to other products or services, published articles on products or services; product features, compatibility, or requirements.

In the case of financial instruments or investments, information might comprise expected profit or margins, past performance of like products, maturity dates, terms, conditions, exclusions, limitations, and exceptions. In the case of automobiles or other durable goods information might comprise models, styles, expected life, efficiencies, colors, capacities, maintenance requirements, options, comparisons between models, published articles on products or excerpts of, pictures of products (still and full motion of product as in its various uses), testimonials of products, commercials, or infomercials. Information for home users when purchasing or renting movies, music, or other forms of entertainment might comprise: ratings, titles, product descriptions, artists or actors, articles written by critics or excerpts of, short segments of music or movie (samples or previews), lists of products available and in general any audio or visual information a customer might wish to know including quote, price, or any information about goods or services other than quote, binder, or price.

As an assistance to any attendant or representative at the central facility that same or related product information can be displayed on the representative's monitor at the central facility to aid in his assisting the customer.

The digital computer **18** stores suitable well-known off-the-shelf operations, communications and perhaps graphics software programs in its memory and is operational to translate the signals, electronic or otherwise, caused to be transmitted from the financial services facility **12** into such displayed, audio reproduced, recorded, or printed information. An example of a suitable communications program is one commercially available under the trademark "Carbon Copy" thus permitting or enabling the representative to control the equipment at the remote facility and permitting the customer to retrieve and access information about goods and services stored at the central facility. An example of a suitable graphics program is one commercially available under the trademark Harvard Graphics which can be used to reconstruct digitally transmitted information back into visual images.

Thus, the agent residing at the central financial services company **12** has the ability to control the above-described electronic communications equipment in the presence of the customer located at the remote facility **14**. The agent is thereby able for example to display any desired information at will on the customer's monitor **22** or to print any information at will on the customer's printer **24**. The customer can respond verbally to central facility prompts initiated by the representative or the central facility equipment via the speaker phone **20** or by using his or her keyboard **26** or other input device or some other means to convey customer supplied information. Such an input device is anticipated to comprise a touch screen permitting the customer to press a screen displayed icon to supply his choices or input, and voice activated response or voice recognition input permitting him to speak his responses, selections, or data input. Personal data to be supplied by the customer can be voice input or supplied by other appropriate means comprising retrieved from a personal data card supplied by the customer by means of a magnetic reader or other comparable device capable of retrieving information thus stored and the system can then permit the customer to update or correct any information provided. The system can also utilize voice synthesis to prompt or present options to the customer and can be used in tandem with visual prompts.

In this fashion the customer can at his leisure and without the assistance of the representative review any desired information about those goods and services he is most interested in with complete privacy yet can by way of his input device request a representative at his will should he desire personal service. He or she can then serve himself should he wish or if preferred he can sit back and let the representative fully control the presentation. The transmitted presentation can utilize a well known spokesperson and give the appearance of a commercial or infomercial. On his own the customer can back up, fast forward, skip, or jump to the specific product information he wishes at his command. His access to this information is described in the computer industry as random. Information can be provided at various levels of detail through a technique known as hypertext. The customer can thus review a summary of specific information and at his request or command receive a level of information of greater detail. One such method of accomplishing the summoning of the representative is to provide an icon or tool on the customer's monitor which he can press or select at any time which in turn causes the system to summon or ring a centrally or alternatively remotely located representative to personally assist the customer.

Additionally a security feature could be installed to protect customers or the remote system from vandalism. Here the user is required to present his credit card or other ID to obtain entry into a locked facility containing the terminal.

Another approach to guard against vandalism is to have a live attendant greet on screen each customer as they approach the system. Alternatively, a camera could be placed on each system to monitor the customer's use and a notice could be posted about the use of the camera to protect the customer's availability to the system. An alarm can also be used that is activated automatically under certain conditions or manually by the rep at the central facility.

In providing the customer an input means we have permitted greater utilization of the representative's time and allowed the customer to only be assisted as he wishes. However it is beneficial to monitor the customer's activity to signal when an appropriate time might be for the representative to voluntarily offer assistance should the customer become confused or lost. An application of a computer technique referred to as artificial intelligence will help identify the occurrence. Such a situation is indicated by a customer's repeated review of the same information or lack of command to the system within a given period of time.

When appropriate the agent can then command the customer's printer **24** to create or print needed contracts and documents (comprising loan application papers, a notice of proposed insurance, an insurance binder, an insurance application, receipts, etc.). The agent can also display his or her own image in a corner of the customer's monitor **22** as a courtesy by using an appropriate communications program and a graphics file produced from the agent's photograph with a conventional image scanner.

In combination with the application for a loan or the presentment of a credit card or some other payment instrument the central facility perhaps under the direction of the representative or under control of the central facility's application software can initiate a credit check to determine the customer's credit worthiness or qualify the customer so as to approve the intended purchase. The central facility can itself store credit or check approval information for each prospective customer or can communicate with a third party such as TRW and exchange appropriate and necessary information on the customer while the customer waits at the remote facility to obtain the necessary credit history in order to process and approve the customer's request. Should the result of the check be negative, the representative can converse with the customer to perhaps arrange for alternate means of payment. Having qualified the customer the central facility can in the event of a loan request conduct the necessary risk evaluation, manually or electronically by means of algorithms to determine loan approval. A similar approach can be taken for insurance requests. The customer can respond to questions regarding his medical history and based upon a search of medical history either at the central facility or at a third party such as the Medical Information Bureau determine the insurability of the customer and insurance approval.

While in the preferred embodiment the final approval for loan or insurance is made upon the customer remitting completed forms either electronically or by mail or some other means it should be understood that having performed the necessary medical or credit check the central facility can immediately approve the customer's application or request for insurance or credit and commit itself. During the solicitation process the central facility can record and store the presentation for beneficial purposes such as to meet regulatory requirements for proof of disclosure as when selling insurance, loans, or investment instruments comprising stocks, bonds, annuities, and mutual funds.

Once the contracts are printed out the customer is directed to sign them and personally place them and any required payment (check) in a mail bag **28** located at the retail sales facility **14**. A binder can be issued upon the customer signing applications for financial services and mailing them so he can take possession of any purchased goods or merchandise in contemplation of the financial services companies accepting the applications and performing final execution of the contracts in the home sovereign.

In the application of entertainment the possession can include the presentment of recorded performances or programming to the customer such as can be transmitted or in some otherwise fashion conveyed to the customer.

Alternatively, some other means of remitting payment and any completed contracts to the agent can be used such as electronically where the customer can for example endorse

an electronic signature box displayed on his monitor by means of an electronic pen or other comparable device and subsequently transmit by modem the electronic contracts back to the central facility or by some other electronic means to permit the customer to legally apply for contracts perhaps comprising the faxing or transmitting of a signed contract from the remote to the central facility.

At the end of a session the system can prompt the customer for comments or take a poll. The customer can respond with his input device. The system can also encourage the customer to speak into a microphone to record the customer's comments on products, assistance provided by a live rep, or the system itself. The advantage in recording the customer's verbal response is that the easier it is for customers to respond the more likely they will. Also, open-ended questions that can be very revealing are difficult to obtain if the customer is required to hand write or type comments. Recording the response will make the best use of the customer's time and improve the success of obtaining this information. As a mechanism for requesting this information the system could list an OFF button. Once a customer has selected OFF the system can begin to execute a closing procedure which could include a customer questionnaire.

At some point during the customer's session the system can prompt them for their address so as to forward additional or updated product information to them perhaps regarding future special offers. This approach introduces a whole new method to sales promotions.

In one embodiment, once a customer has selected and paid for his purchase those products that can not be delivered on the spot (such as via a remote printer or other device permitting the culmination of a transaction) can be delivered to the customer such as at his residence or place of business. Alternatively, customers can pick up their purchases at a central order processing center.

Another embodiment provides for team shopping permitting a group customers at the same or different locations to view the same presentation simultaneously under the control of one of the customers as they speak with each other. In this instance a customer at the same or different remote location will assume control of the input device for one or more different customers. Control of the system can alternate between the individuals so that at times a first customer can control the presentation while at another time a second or other customer can assume control. The selected information will be presented to each shopper in the party though they can be at different customer locations. In this way each person in the group can share with the others products they find interesting. At the same time they can all engage in a group conversation or perhaps video conference so each can hear the other as they review the presentations together.

The advantage of this approach is that historically electronic systems have failed to captivate certain segments of the population such as females. Part of the problem is that the act of using such a system has to this point been a solitary activity. While some customers can be content using the system by themselves, others are more group oriented and prefer social contact. For example, while some people (perhaps men) will be more inclined to visit a store or go shopping by themselves, others (perhaps women) are more likely to be accompanied by a friend. This embodiment of the system then recognizes these differences between customers and allows those who are more group oriented to use the system in a way they are comfortable with.

Another use of the system is to create electronic cities. Here the system creates a tour to guide electronic tourists through a selected city showing important points of interest as presented by an electronic version of a tour guide with verbal narration. Customers are allowed to browse and shop on their own at anytime. Using the system in this way customers are able to electronically sightsee and shop at a selection of cities within their country and internationally. The ability to tie in the flavor and charm of a city or country with its products should greatly encourage customers to shop and make the customer's experience fascinating. Cities and countries could introduce themselves in a positive way and encourage tourism. The system's use in this fashion allows it to disseminate knowledge of a region and its people to others helping to improve relations between cities and countries.

Another version of the invention utilizes a full blown video conference center providing a large screen, perhaps wall sized, 2 way color video and audio device in addition to a remote printer used to generate or print documents for the prospective customer. In this fashion the customer is placed in a theater like environment so he can comfortably view any desired product information by means of full motion, full color, audio/visual presentations. Images can be displayed by holograms or similar 3 dimensional means to give life and form to goods or services sold.

Alternatively the video can be 1 way or nonreciprocal versus 2 way or reciprocal should the customer prefer to not be on camera. It can as well be monochrome as opposed to color where preferable such as when communication resources are not available to achieve full color video. To put the customer at ease at the start of each session the customer's monitor can display his own image permitting him to make any grooming adjustments he wishes and in doing so better put his mind at rest.

In addition to accepting a credit card or similar means as payment for system use, the system could accept cash or any other payment means.

Although the system **10** has been described with reference to financial services, the concept of the present invention is not so limited. It can be used to sell or assist in selling all goods and services comprising cars, boats, motorcycles, vacations, travel packages, investments, furniture, real estate, service contracts, product warranties, entertainment, financial services, and all other goods or services a customer might desire to remote customers whether or not financed or insured such as at a consumer goods store where customers use the system to select and transact their purchase.

In this sense the system serves as an expert system allowing the customer to obtain knowledgeable assistance from a central facility and its salesperson or representative. This is especially beneficial for customers of retail stores which sell large ticket items or complicated products which require or benefit from highly or moderately skilled sales people. This responds to a common complaint that few stores have knowledgeable staff. The customer can then select and pay for his purchase at the terminal and take possession of his goods upon leaving. In using the equipment in this fashion the provider of the equipment can charge the customer a fee for use of the system and its services for which it can then provide the customer with a printed coupon, rebate or voucher for free goods or services, or an equivalent or partial discount should the customer purchase his goods or services at that remote location during an unlimited or limited future period of time.

Such a system will be of great benefit to an employment agency or head hunter who might then record interviews with a selection of employee candidates for presentation

purposes permitting prospective employers to browse the catalogue of candidates in quickly narrowing and finalizing their recruiting search.

It can now be readily seen that the system **10** of the present invention accomplishes its first object identified above by centralizing the administration and selling of products and thereby substantially reduces the costs associated with creating, marketing, and administering these products and services. The system **10** also accomplishes its second object identified above by consolidating all management activities of the financial services products with the central office. The primary or only task of the retail sales location in the preferred embodiment is to refer the customer to the equipment at the remote location. Hence, all possible responsibilities are centralized permitting better control and simplifying ongoing management. With the great reduction in costs associated with developing and administering new products it is now possible, that is affordable, to develop a greater variety of products which are then more likely to fit the needs of specific customers. The third object is achieved as new product supporting materials, such as computer programs and other sales materials, are now centralized and it is no longer necessary to train an army of outside staff to sell and support the new products, giving the financial services company or other provider of goods and services more control as well on the sales process.

The foregoing description of the preferred embodiment of the invention has been presented for the purposes of illustration and description. It is not intended to be exhaustive or to limit the invention to the precise form disclosed. Many modifications and variations are possible in light of the above teaching. Such modifications and variations are deemed to be within the scope of this invention.

What is claimed is:

**1**. In a system for shopping for goods and services, utilizing central communications facilities and remote communications facilities connected by communications links adapted to permit data communications between processors at remote and central communications facilities, wherein the central communications facilities have been regionally located branches of each other with input for remote facilities controlled by the central communications facilities, the improvement providing a system wherein customers can shop for cars, boats, motorcycles, vacations, travel packages, investments, furniture, real estate, service contracts, product warranties, entertainment, financial services, and other goods or services a customer might desire to price competitively, said improvement including:

means providing multiple competing central communications facilities offering a greater number of competing goods and services in order to increase competition;

means for storing in a database in each central communications facility data, graphics in the form of video and audio in the form of computerized voice and music, each relating to the competing goods and services being offered to the remote communications facility;

computer input means at each remote communications facility permitting customers at remote communications facilities to access the data, graphics and audio relative to the competing goods and services in the database at central communications facilities;

computer means enabling each central communications facility to transmit data, graphics, and audio relative to the competing goods and services to each remote communications facility from its database;

electronic and computing means at each remote communications facility enabling that facility to receive and download date, graphics, and audio relative to the competing goods and services thus transmitted;

hypertext application software for providing remote facility information relative to competing goods and services at various levels of detail;

means permitting the remote communications facility to access and browse different levels of the information;

means for recording a stopping point in the customer's browsing, and for using that stopping point to enable the customer to continue where he left off;

computer input means at each remote communications facility enabling a customer, after viewing the data, graphics, and audio relative to the competing goods and services, to electronically negotiate prices relative to the goods and services; and

means enabling each central communications facility to generate and transmit to the remote facility transaction necessary contracts and documents for any of financing, paying, and insuring, at prices, so negotiated, the competing goods and services.

**2**. The improvement of claim **1** including means enabling a customer to interact selectively with a live representative.

**3**. The improvement of claim **1** including means adapted to enable a customer to browse in the database at the central communications facility for goods according to model, manufacturer and marketer of such goods.

**4**. The improvement of claim **1** including means for recording customer responses during use of the system to build a customer profile.

**5**. The improvement of claim **3** including means for periodically updating the customer profile.

* * * * *

UNITED STATES PATENT AND TRADEMARK OFFICE

# CERTIFICATE OF CORRECTION

PATENT NO. : 6,055,514
DATED : April 25, 2000
INVENTOR(S) : Stephen Corey Wren

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

On the title page, item [54] & Column 1.

"FOODS" should read -- GOODS --; and
"CENTRALAND" should read --CENTRAL AND --.

Signed and Sealed this

Sixth Day of March, 2001

*Attest:*

Nicholas P. Godici

NICHOLAS P. GODICI

*Attesting Officer*

*Acting Director of the United States Patent and Trademark Office*

If the Board's decision also includes an affirmance of the examiner's rejection, a request for rehearing of the affirmance (see MPEP § 1214.03 and MPEP § 1214.06, paragraph IV) should be filed in a separate paper to facilitate consideration.

## 1214.03 Rehearing [R-3]

**>

*37 CFR 41.52. Rehearing.*

(a)(1)Appellant may file a single request for rehearing within two months of the date of the original decision of the Board. No request for rehearing from a decision on rehearing will be permitted, unless the rehearing decision so modified the original decision as to become, in effect, a new decision, and the Board states that a second request for rehearing would be permitted. The request for rehearing must state with particularity the points believed to have been misapprehended or overlooked by the Board. Arguments not raised in the briefs before the Board and evidence not previously relied upon in the brief and any reply brief(s) are not permitted in the request for rehearing except as permitted by paragraphs (a)(2) and (a)(3) of this section. When a request for rehearing is made, the Board shall render a decision on the request for rehearing. The decision on the request for rehearing is deemed to incorporate the earlier opinion reflecting its decision for appeal, except for those portions specifically withdrawn on rehearing, and is final for the purpose of judicial review, except when noted otherwise in the decision on rehearing.

(2) Upon a showing of good cause, appellant may present a new argument based upon a recent relevant decision of either the Board or a Federal Court.

(3) New arguments responding to a new ground of rejection made pursuant to § 41.50(b) are permitted.

(b) Extensions of time under § 1.136(a) of this title for patent applications are not applicable to the time period set forth in this section. See § 1.136(b) of this title for extensions of time to reply for patent applications and § 1.550(c) of this title for extensions of time to reply for ex parte reexamination proceedings.<

The term "rehearing" is used in 37 CFR *>41.52< for consistency with the language of 35 U.S.C. 6(b). It should not be interpreted as meaning that an appellant is entitled to an oral hearing on the request for rehearing, but only to a rehearing on the written record. It is not the normal practice of the Board to grant rehearings in the sense of another oral hearing. *Ex parte Argoudelis*, 157 USPQ 437, 441 (Bd. App. 1967), *rev'd. on other grounds*, 434 F.2d 1390, 168 USPQ 99 (CCPA 1970).

37 CFR *>41.52< provides that any request for rehearing must specifically state the points believed to have been misapprehended or overlooked in the Board's decision. Experience has shown that many requests for rehearing are nothing more than reargument of appellant's position on appeal. In response, the rule was revised to limit requests to the points of law or fact which appellant feels were overlooked or misapprehended by the Board. >Arguments not raised in the briefs before the Board and evidence not previously relied upon in the brief and any reply brief(s) are not permitted in the request for rehearing except (A) upon a showing of good cause, appellant may present a new argument based upon a recent relevant decision of either the Board or a Federal Court, and (B) new arguments responding to a new ground of rejection made pursuant to 37 CFR 41.50(b). If appellant establishes good cause for a new argument based upon a recent relevant decision of either the Board or a Federal Court, a remand by the Board to the examiner to respond to that new argument may be appropriate.<

The 2-month period provided by 37 CFR *>41.52(a)< for filing a request for rehearing can only be extended under the provisions of 37 CFR 1.136(b) or under 37 CFR 1.550(c) if the appeal involves an *ex parte* reexamination proceeding.

**

For extension of time to appeal to the Court of Appeals for the Federal Circuit or commence a civil action under 37 CFR 1.304(a), see MPEP § 1216 and § 1002.02(o).

For requests for reconsideration by the examiner, see MPEP § 1214.04.

>Should an Administrative Patent Judge (APJ) retire or otherwise become unavailable to reconsider a decision, normally another APJ will be designated as a substitute for the unavailable APJ.<

## 1214.04 Examiner Reversed [R-3]

A complete reversal of the examiner's rejection brings the case up for immediate action by the examiner. If the reversal does not place an application in condition for immediate allowance (e.g., the Board has entered a new ground of rejection under 37 CFR *>41.50(b)<), the examiner should refer to the situations outlined in MPEP § 1214.06 for appropriate guidance.

The examiner should never regard such a reversal as a challenge to make a new search to uncover other and better references. This is particularly so where the application or *ex parte* reexamination proceeding has meanwhile been transferred or assigned to an exam-

iner other than the one who rejected the claims leading to the appeal. The second examiner should give full faith and credit to the prior examiner's search.

If the examiner has specific knowledge of the existence of a particular reference or references which indicate nonpatentability of any of the appealed claims as to which the examiner was reversed, he or she should submit the matter to the Technology Center (TC) Director for authorization to reopen prosecution under 37 CFR 1.198 for the purpose of entering the new rejection. See MPEP § 1002.02(c) and MPEP § 1214.07. The TC Director's approval is placed on the action reopening prosecution.

The examiner may request rehearing of the Board decision. Such a request should normally be made within 2 months of the receipt of the Board decision in the TC. The TC Director's secretary should therefore date stamp all Board decisions upon receipt in the TC.

All requests by the examiner to the Board for rehearing of a decision must be approved by the TC Director and must also be forwarded to the Office of the Deputy Commissioner for Patent Examination Policy for approval before mailing.

>The request for rehearing must state with particularity the points believed to have been misapprehended or overlooked by the Board. Arguments not raised in the answers before the Board and evidence not previously relied upon in the answers are not permitted in the request for rehearing except upon a showing of good cause, the examiner may present a new argument based upon a recent relevant decision of either the Board or a Federal Court.<

The request should set a period of **>2 months< for the appellant to file a reply.

If **>the request for rehearing is approved by< the Office of the Deputy Commissioner for Patent Examination Policy>, the TC< will mail a copy of the request for rehearing to the appellant. After the period set for appellant to file a reply (plus mailing time) has expired, the application file will be forwarded to the Board.

## 1214.05 Cancellation of Withdrawn Claims [R-3]

Where an appellant withdraws some of the appealed claims >(i.e., claims subject to a ground of rejection that the appellant did not present for review in the brief)<, and the Board reverses the examiner on the remaining appealed claims, the withdrawal is treated as an authorization to cancel the withdrawn claims. It is *necessary >for the examiner< to notify the appellant of the cancellation of the withdrawn claims. >See MPEP § 1215.03.<

## 1214.06 Examiner Sustained in Whole or in Part [R-3]

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*37 CFR 1.197. Return of jurisdiction from the Board of Patent Appeals and Interferences; termination of proceedings.*

(a) *Return of jurisdiction from the Board of Patent Appeals and Interferences.* Jurisdiction over an application or patent under ex parte reexamination proceeding passes to the examiner after a decision by the Board of Patent Appeals and Interferences upon transmittal of the file to the examiner, subject to appellant's right of appeal or other review, for such further action by appellant or by the examiner, as the condition of the application or patent under ex parte reexamination proceeding may require, to carry into effect the decision of the Board of Patent Appeals and Interferences.

(b) *Termination of proceedings.*

(1) Proceedings on an application are considered terminated by the dismissal of an appeal or the failure to timely file an appeal to the court or a civil action (§ 1.304) except:

(i) Where claims stand allowed in an application; or

(ii) Where the nature of the decision requires further action by the examiner.

(2) The date of termination of proceedings on an application is the date on which the appeal is dismissed or the date on which the time for appeal to the U.S. Court of Appeals for the Federal Circuit or review by civil action (§ 1.304) expires in the absence of further appeal or review. If an appeal to the U.S. Court of Appeals for the Federal Circuit or a civil action has been filed, proceedings on an application are considered terminated when the appeal or civil action is terminated. A civil action is terminated when the time to appeal the judgment expires. An appeal to the U.S. Court of Appeals for the Federal Circuit, whether from a decision of the Board or a judgment in a civil action, is terminated when the mandate is issued by the Court.<

>The practice under the situations identified in paragraphs I-III below is similar to the practice after a decision of the court outlined in MPEP § 1216.01. Examiners must be very careful that case files that come back from the Board are not overlooked because every case, except applications in which all claims stand rejected after the Board's decision, is up for action by the examiner in the event no court review has been sought. See MPEP § 1216.01 and § 1216.02 for procedure where court review is sought.<

law. They are designed to assist Office personnel in analyzing claimed subject matter for compliance with substantive law. Rejections will be based upon the substantive law, and it is these rejections which are appealable. Consequently, any perceived failure by Office personnel to follow these Guidelines is neither appealable nor petitionable.

These Guidelines are intended to form part of the normal examination process. Thus, where Office personnel establish a prima facie case of lack of written description for a claim, a thorough review of the prior art and examination on the merits for compliance with the other statutory requirements, including those of 35 U.S.C. 101, 102, 103, and 112, is to be conducted prior to completing an Office action which includes a rejection for lack of written description.

## I. GENERAL PRINCIPLES GOVERNING COMPLIANCE WITH THE "WRITTEN DESCRIPTION" REQUIREMENT FOR APPLICATIONS

The first paragraph of 35 U.S.C. 112 requires that the "specification shall contain a written description of the invention * * *." This requirement is separate and distinct from the enablement requirement. See, e.g., *Vas-Cath, Inc. v. Mahurkar*, 935 F.2d 1555, 1560, 19 USPQ2d 1111, 1114 (Fed. Cir. 1991). See also *Univ. of Rochester v. G.D. Searle & Co.*, 358 F.3d 916, 920-23, 69 USPQ2d 1886, 1890-93 (Fed. Cir. 2004) (discussing history and purpose of the written description requirement); *In re Curtis*, 354 F.3d 1347, 1357, 69 USPQ2d 1274, 1282 (Fed. Cir. 2004) ("conclusive evidence of a claim's enablement is not equally conclusive of that claim's satisfactory written description"). The written description requirement has several policy objectives. "[T]he 'essential goal' of the description of the invention requirement is to clearly convey the information that an applicant has invented the subject matter which is claimed." *In re Barker*, 559 F.2d 588, 592 n.4, 194 USPQ 470, 473 n.4 (CCPA 1977). Another objective is to put the public in possession of what the applicant claims as the invention. See *Regents of the University of California v. Eli Lilly*, 119 F.3d 1559, 1566, 43 USPQ2d 1398, 1404 (Fed. Cir. 1997), *cert. denied*, 523 U.S. 1089 (1998). *>"The 'written description' requirement implements the principle that a patent must describe the technology that is sought to be patented; the requirement serves both to satisfy the inventor's obligation to disclose the technologic knowledge upon which the patent is based, and to demonstrate that the patentee was in possession of the invention that is claimed." *Capon v. Eshhar*, 418 F.3d 1349, 1357, 76 USPQ2d 1078, 1084 (Fed. Cir. 2005). Further, the< written description requirement ** promotes the progress of the useful arts by ensuring that patentees adequately describe their inventions in their patent specifications in exchange for the right to exclude others from practicing the invention for the duration of the patent's term.

To satisfy the written description requirement, a patent specification must describe the claimed invention in sufficient detail that one skilled in the art can reasonably conclude that the inventor had possession of the claimed invention. See, e.g., *Moba, B.V. v. Diamond Automation, Inc.*, 325 F.3d 1306, 1319, 66 USPQ2d 1429, 1438 (Fed. Cir. 2003); *Vas-Cath, Inc. v. Mahurkar*, 935 F.2d at 1563, 19 USPQ2d at 1116. However, a showing of possession alone does not cure the lack of a written description. *Enzo Biochem, Inc. v. Gen-Probe, Inc.*, 323 F.3d 956, 969-70, 63 USPQ2d 1609, 1617 (Fed. Cir. 2002). Much of the written description case law addresses whether the specification as originally filed supports claims not originally in the application. The issue raised in the cases is most often phrased as whether the original application provides "adequate support" for the claims at issue or whether the material added to the specification incorporates "new matter" in violation of 35 U.S.C. 132. The "written description" question similarly arises in the interference context, where the issue is whether the specification of one party to the interference can support the newly added claims corresponding to the count at issue, i.e., whether that party can "make the claim" corresponding to the interference count. See, e.g., *Martin v. Mayer*, 823 F.2d 500, 503, 3 USPQ2d 1333, 1335 (Fed. Cir. 1987). In addition, early opinions suggest the Patent and Trademark Office was unwilling to find written descriptive support when the only description was found in the claims; however, this viewpoint was rejected. See *In re Koller*, 613 F.2d 819, 204 USPQ 702 (CCPA 1980) (original claims constitute their own description); accord *In re Gardner*, 475 F.2d 1389, 177 USPQ 396 (CCPA 1973); *accord In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976). It is now well accepted

that a satisfactory description may be in the claims or any other portion of the originally filed specification. These early opinions did not address the quality or specificity of particularity that was required in the description, i.e., how much description is enough.

An applicant shows possession of the claimed invention by describing the claimed invention with all of its limitations using such descriptive means as words, structures, figures, diagrams, and formulas that fully set forth the claimed invention. *Lockwood v. American Airlines, Inc.*, 107 F.3d 1565, 1572, 41 USPQ2d 1961, 1966 (Fed. Cir. 1997). Possession may be shown in a variety of ways including description of an actual reduction to practice, or by showing that the invention was "ready for patenting" such as by the disclosure of drawings or structural chemical formulas that show that the invention was complete, or by describing distinguishing identifying characteristics sufficient to show that the applicant was in possession of the claimed invention. See, e.g., *Pfaff v. Wells Elecs., Inc.*, 525 U.S. 55, 68, 119 S.Ct. 304, 312, 48 USPQ2d 1641, 1647 (1998); *Eli Lilly*, 119 F.3d at 1568, 43 USPQ2d at 1406; *Amgen, Inc. v. Chugai Pharmaceutical*, 927 F.2d 1200, 1206, 18 USPQ2d 1016, 1021 (Fed. Cir. 1991) (one must define a compound by "whatever characteristics sufficiently distinguish it"). "Compliance with the written description requirement is essentially a fact-based inquiry that will 'necessarily vary depending on the nature of the invention claimed.'" *Enzo Biochem*, 323 F.3d at 963, 63 USPQ2d at 1613. An application specification may show actual reduction to practice by describing testing of the claimed invention or, in the case of biological materials, by specifically describing a deposit made in accordance with 37 CFR 1.801 *et seq.* See *Enzo Biochem*, 323 F.3d at 965, 63 USPQ2d at 1614 ("reference in the specification to a deposit may also satisfy the written description requirement with respect to a claimed material"); see also Deposit of Biological Materials for Patent Purposes, Final Rule, 54 FR 34,864 (August 22, 1989) ("The requirement for a specific identification is consistent with the description requirement of the first paragraph of 35 U.S.C. 112, and to provide an antecedent basis for the biological material which either has been or will be deposited before the patent is granted." Id. at 34,876. "The description must be sufficient to permit verification that the deposited biological material is in fact that disclosed. Once the patent issues, the description must be sufficient to aid in the resolution of questions of infringement." Id. at 34,880.). Such a deposit is not a substitute for a written description of the claimed invention. The written description of the deposited material needs to be as complete as possible because the examination for patentability proceeds solely on the basis of the written description. See, e.g., *In re Lundak*, 773 F.2d 1216, 227 USPQ 90 (Fed. Cir. 1985). See also 54 FR at 34,880 ("As a general rule, the more information that is provided about a particular deposited biological material, the better the examiner will be able to compare the identity and characteristics of the deposited biological material with the prior art.").

A question as to whether a specification provides an adequate written description may arise in the context of an original claim which is not described sufficiently (see, e.g., >*LizardTech, Inc. v. Earth Resource Mapping, Inc.*, 424 F.3d 1336, 1345, 76 USPQ2d 1724, 1733 (Fed. Cir. 2005);< Enzo Biochem, 323 F.3d at 968, 63 USPQ2d at 1616 (Fed. Cir. 2002); *Eli Lilly*, 119 F.3d 1559, 43 USPQ2d 1398), a new or amended claim wherein a claim limitation has been added or removed, or a claim to entitlement of an earlier priority date or effective filing date under 35 U.S.C. 119, 120, or 365(c). Most typically, the issue will arise in the context of determining whether new or amended claims are supported by the description of the invention in the application as filed (see, e.g., *In re Wright*, 866 F.2d 422, 9 USPQ2d 1649 (Fed. Cir. 1989)), whether a claimed invention is entitled to the benefit of an earlier priority date or effective filing date under 35 U.S.C. 119, 120, or 365(c) (see, e.g., *New Railhead Mfg. L.L.C. v. Vermeer Mfg. Co.*, 298 F.3d 1290, 63 USPQ2d 1843 (Fed. Cir. 2002); *Tronzo v. Biomet, Inc.*, 156 F.3d 1154, 47 USPQ2d 1829 (Fed. Cir. 1998); Fiers v. Revel, 984 F.2d 1164, 25 USPQ2d 1601 (Fed. Cir. 1993); *In re Ziegler*, 992 F.2d 1197, 1200, 26 USPQ2d 1600, 1603 (Fed. Cir. 1993)), or whether a specification provides support for a claim corresponding to a count in an interference (see, e.g., *Fields v. Conover*, 443 F.2d 1386, 170 USPQ 276 (CCPA 1971)). Compliance with the written description requirement is a question of fact which must be resolved on a case-by-case basis. *Vas-Cath, Inc. v. Mahurkar*, 935 F.2d at 1563, 19 USPQ2d at 1116 (Fed. Cir. 1991).

### *A. Original Claims*

There is a strong presumption that an adequate written description of the claimed invention is present when the application is filed. *In re Wertheim*, 541 F.2d 257, 263, 191 USPQ 90, 97 (CCPA 1976) ("we are of the opinion that the PTO has the initial burden of presenting evidence or reasons why persons skilled in the art would not recognize in the disclosure a description of the invention defined by the claims"). However, as discussed in paragraph I., *supra*, the issue of a lack of adequate written description may arise even for an original claim when an aspect of the claimed invention has not been described with sufficient particularity such that one skilled in the art would recognize that the applicant had possession of the claimed invention. The claimed invention as a whole may not be adequately described if the claims require an essential or critical feature which is not adequately described in the specification and which is not conventional in the art or known to one of ordinary skill in the art. For example, consider the claim "A gene comprising SEQ ID NO:1." A determination of what the claim as a whole covers may result in a conclusion that specific structures such as a promoter, a coding region, or other elements are included. Although all genes encompassed by this claim share the characteristic of comprising SEQ ID NO:1, there may be insufficient description of those specific structures (e.g., promoters, enhancers, coding regions, and other regulatory elements) which are also included.

The claimed invention as a whole may not be adequately described where an invention is described solely in terms of a method of its making coupled with its function and there is no described or art-recognized correlation or relationship between the structure of the invention and its function. A biomolecule sequence described only by a functional characteristic, without any known or disclosed correlation between that function and the structure of the sequence, normally is not a sufficient identifying characteristic for written description purposes, even when accompanied by a method of obtaining the claimed sequence. For example, even though a genetic code table would correlate a known amino acid sequence with a genus of coding nucleic acids, the same table cannot predict the native, naturally occurring nucleic acid sequence of a naturally occurring mRNA or its corresponding cDNA. Cf. *In re Bell*, 991 F.2d 781, 26 USPQ2d 1529 (Fed. Cir. 1993), and *In re Deuel*, 51 F.3d 1552, 34 USPQ2d 1210 (Fed. Cir. 1995) (holding that a process could not render the product of that process obvious under 35 U.S.C. 103). The Federal Circuit has pointed out that under United States law, a description that does not render a claimed invention obvious cannot sufficiently describe the invention for the purposes of the written description requirement of 35 U.S.C. 112. *Eli Lilly*, 119 F.3d at 1567, 43 USPQ2d at 1405. Compare *Fonar Corp. v. General Electric Co.*, 107 F.3d 1543, 1549, 41 USPQ2d 1801, 1805 (Fed. Cir. 1997) ("As a general rule, where software constitutes part of a best mode of carrying out an invention, description of such a best mode is satisfied by a disclosure of the functions of the software. This is because, normally, writing code for such software is within the skill of the art, not requiring undue experimentation, once its functions have been disclosed. * * * Thus, flow charts or source code listings are not a requirement for adequately disclosing the functions of software.").

A lack of adequate written description issue also arises if the knowledge and level of skill in the art would not permit one skilled in the art to immediately envisage the product claimed from the disclosed process. See, e.g., *Fujikawa v. Wattanasin*, 93 F.3d 1559, 1571, 39 USPQ2d 1895, 1905 (Fed. Cir. 1996) (a "laundry list" disclosure of every possible moiety does not constitute a written description of every species in a genus because it would not "reasonably lead" those skilled in the art to any particular species); *In re Ruschig*, 379 F.2d 990, 995, 154 USPQ 118, 123 (CCPA 1967) ("*If* n-propylamine had been used in making the compound instead of n-butylamine, the compound of claim 13 would have resulted. Appellants submit to us, as they did to the board, an imaginary specific example patterned on specific example 6 by which the above butyl compound is made so that we can see what a simple change would have resulted in a specific supporting disclosure being present in the present specification. The trouble is that there is no such disclosure, easy though it is to imagine it.") (emphasis in original); *Purdue Pharma L.P. v. Faulding Inc.*, 230 F.3d 1320, 1328, 56 USPQ2d 1481, 1487 (Fed. Cir. 2000) ("the specification does not clearly disclose to the skilled artisan that the inventors ... considered the ratio... to be part of their invention .... There is therefore no force to Purdue's argument that

the written description requirement was satisfied because the disclosure revealed a broad invention from which the [later-filed] claims carved out a patentable portion").

### *B. New or Amended Claims*

The proscription against the introduction of new matter in a patent application (35 U.S.C. 132 and 251) serves to prevent an applicant from adding information that goes beyond the subject matter originally filed. See *In re Rasmussen*, 650 F.2d 1212, 1214, 211 USPQ 323, 326 (CCPA 1981). See MPEP § 2163.06 through § 2163.07 for a more detailed discussion of the written description requirement and its relationship to new matter. The claims as filed in the original specification are part of the disclosure and, therefore, if an application as originally filed contains a claim disclosing material not found in the remainder of the specification, the applicant may amend the specification to include the claimed subject matter. *In re Benno*, 768 F.2d 1340, 226 USPQ 683 (Fed. Cir. 1985). Thus, the written description requirement prevents an applicant from claiming subject matter that was not adequately described in the specification as filed. New or amended claims which introduce elements or limitations which are not supported by the as-filed disclosure violate the written description requirement. See, e.g., *In re Lukach*, 442 F.2d 967, 169 USPQ 795 (CCPA 1971) (subgenus range was not supported by generic disclosure and specific example within the subgenus range); *In re Smith*, 458 F.2d 1389, 1395, 173 USPQ 679, 683 (CCPA 1972) (a subgenus is not necessarily described by a genus encompassing it and a species upon which it reads).

While there is no *in haec verba* requirement, newly added claim limitations must be supported in the specification through express, implicit, or inherent disclosure. An amendment to correct an obvious error does not constitute new matter where one skilled in the art would not only recognize the existence of the error in the specification, but also recognize the appropriate correction. *In re Oda*, 443 F.2d 1200, 170 USPQ 268 (CCPA 1971). With respect to the correction of sequencing errors in applications disclosing nucleic acid and/or amino acid sequences, it is well known that sequencing errors are a common problem in molecular biology. See, e.g., Peter Richterich, Estimation of Errors in 'Raw' DNA Sequences: A Validation Study, 8 *Genome Research* 251-59 (1998). If an application as filed includes sequence information and references a deposit of the sequenced material made in accordance with the requirements of 37 CFR 1.801 *et seq.*, amendment may be permissible. Deposits made after the application filing date cannot be relied upon to support additions to or correction of information in the application as filed. Corrections of minor errors in the sequence may be possible based on the argument that one of skill in the art would have resequenced the deposited material and would have immediately recognized the minor error. Deposits made after the filing date can only be relied upon to provide support for the correction of sequence information if applicant submits a statement in compliance with 37 CFR 1.804 stating that the biological material which is deposited is a biological material specifically defined in the application as filed.

Under certain circumstances, omission of a limitation can raise an issue regarding whether the inventor had possession of a broader, more generic invention. See, e.g., *PIN/NIP, Inc. v. Platte Chem. Co.*, 304 F.3d 1235, 1248, 64 USPQ2d 1344, 1353 (Fed. Cir. 2002) (Claim for a method of inhibiting sprout growth on tubers by treating them with spaced, sequential application of two chemicals was held invalid for lack of adequate written description where the specification indicated that invention was a method of applying a "composition," or mixture, of the two chemicals.); *Gentry Gallery, Inc. v. Berkline Corp.*, 134 F.3d 1473, 45 USPQ2d 1498 (Fed. Cir. 1998) (claims to a sectional sofa comprising, inter alia, a console and a control means were held invalid for failing to satisfy the written description requirement where the claims were broadened by removing the location of the control means); *Johnson Worldwide Associates v. Zebco Corp.*, 175 F.3d 985, 993, 50 USPQ2d 1607, 1613 (Fed. Cir. 1999) (In *Gentry Gallery*, the "court's determination that the patent disclosure did not support a broad meaning for the disputed claim terms was premised on clear statements in the written description that described the location of a claim element--the 'control means' --as 'the only possible location' and that variations were 'outside the stated purpose of the invention.' *Gentry Gallery*, 134 F.3d at 1479, 45 USPQ2d at 1503. *Gentry Gallery*, then, considers the

situation where the patent's disclosure makes crystal clear that a particular (i.e., narrow) understanding of a claim term is an 'essential element of [the inventor's] invention.'"); *Tronzo v. Biomet*, 156 F.3d at 1158-59, 47 USPQ2d at 1833 (Fed. Cir. 1998) (claims to generic cup shape were not entitled to filing date of parent application which disclosed "conical cup" in view of the disclosure of the parent application stating the advantages and importance of the conical shape.). A claim that omits an element which applicant describes as an essential or critical feature of the invention originally disclosed does not comply with the written description requirement. See *Gentry Gallery*, 134 F.3d at 1480, 45 USPQ2d at 1503; *In re Sus*, 306 F.2d 494, 504, 134 USPQ 301, 309 (CCPA 1962) ("[O]ne skilled in this art would not be taught by the written description of the invention in the specification that any 'aryl or substituted aryl radical' would be suitable for the purposes of the invention but rather that only certain aryl radicals and certain specifically substituted aryl radicals [i.e., aryl azides] would be suitable for such purposes.") (emphasis in original). A claim which omits matter disclosed to be essential to the invention as described in the specification or in other statements of record may also be subject to rejection under 35 U.S.C. 112, para. 1, as not enabling, or under 35 U.S.C. 112, para. 2. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976); *In re Venezia*, 530 F.2d 956, 189 USPQ 149 (CCPA 1976); and *In re Collier*, 397 F.2d 1003, 158 USPQ 266 (CCPA 1968). See also MPEP § 2172.01.

The fundamental factual inquiry is whether the specification conveys with reasonable clarity to those skilled in the art that, as of the filing date sought, applicant was in possession of the invention as now claimed. See, e.g., *Vas-Cath, Inc.*, 935 F.2d at 1563-64, 19 USPQ2d at 1117.

## II. METHODOLOGY FOR DETERMINING ADEQUACY OF WRITTEN DESCRIPTION

### *A. Read and Analyze the Specification for Compliance with 35 U.S.C. 112, para. 1*

Office personnel should adhere to the following procedures when reviewing patent applications for compliance with the written description requirement of 35 U.S.C. 112, para. 1. The examiner has the initial burden, after a thorough reading and evaluation of the content of the application, of presenting evidence or reasons why a person skilled in the art would not recognize that the written description of the invention provides support for the claims. There is a strong presumption that an adequate written description of the claimed invention is present in the specification as filed, *Wertheim*, 541 F.2d at 262, 191 USPQ at 96; however, with respect to newly added or amended claims, applicant should show support in the original disclosure for the new or amended claims. See MPEP § 714.02 and § 2163.06 ("Applicant should * * * specifically point out the support for any amendments made to the disclosure."); and MPEP § 2163.04 ("If applicant amends the claims and points out where and/or how the originally filed disclosure supports the amendment(s), and the examiner finds that the disclosure does not reasonably convey that the inventor had possession of the subject matter of the amendment at the time of the filing of the application, the examiner has the initial burden of presenting evidence or reasoning to explain why persons skilled in the art would not recognize in the disclosure a description of the invention defined by the claims."). Consequently, rejection of an original claim for lack of written description should be rare. The inquiry into whether the description requirement is met is a question of fact that must be determined on a case-by-case basis. See *In re Smith*, 458 F.2d 1389, 1395, 173 USPQ 679, 683 (CCPA 1972) ("Precisely how close [to the claimed invention] the description must come to comply with Sec. 112 must be left to case-by-case development."); *In re Wertheim*, 541 F.2d at 262, 191 USPQ at 96 (inquiry is primarily factual and depends on the nature of the invention and the amount of knowledge imparted to those skilled in the art by the disclosure).

#### 1. For Each Claim, Determine What the Claim as a Whole Covers

Claim construction is an essential part of the examination process. Each claim must be separately analyzed and given its broadest reasonable interpretation in light of and consistent with the written description. See, e.g., *In re Morris*, 127 F.3d 1048, 1053-54, 44 USPQ2d 1023, 1027 (Fed. Cir. 1997). The entire claim must be considered, including the preamble language and the transitional phrase. "Preamble language" is that language in a claim appearing before

## X. RELATED PROCEEDINGS APPENDIX

Copies of:

Board Decision in Appeal No. 2008-1046

Board Decision in Appeal No. 2008-1056

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

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*Ex parte* DENNIS SUNGA FERNANDEZ
and IRENE HU FERNANDEZ

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Appeal 2008-1046
Application 09/823,089
Technology Center 2600

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Decided: September 29, 2008

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Before KENNETH W. HAIRSTON, JOHN A. JEFFERY,
and R. EUGENE VARNDELL, JR., *Administrative Patent Judges.*

VARNDELL, *Administrative Patent Judge.*

DECISION ON APPEAL

Appellants appeal under 35 U.S.C. § 134 from the Examiner's rejections of claims 37-66. We have jurisdiction under 35 U.S.C. § 6(b). We AFFIRM-IN-PART.

## STATEMENT OF THE CASE

Appellants' invention relates to a cellphone and a method for cellphone communication (Spec. 12). The cellphone or method claimed on appeal includes a communication module comprising a user-customizable or reconfigurable software program, firmware or circuit accessible locally in the cellphone or remotely via the network, the communication module being partitionable or uninstallable (Spec. 9, 14-16). The claimed cellphone or method also includes a sensor comprising a camera capable of recording the image, audio or video signal, and recognizing the cellphone user voice or image (Spec. 10). The cellphone or method on appeal further includes a wireless communicator that communicates within a group of cellphones chatting privately in multi-cast mode using an embedded watermark or digital certificate, thereby securing such group communication electronically (Spec. 14).

Claims 37, 39, 43, 52, and 54, which further illustrate the invention, follow:

> 37. Cellphone for communicating with a networked controller comprising:
>
> a wireless communicator for communicating remotely with a networked controller via a network;
>
> a locator for providing a cellphone location to the networked controller via the wireless communicator;
>
> a sensor for providing an image, audio, or video signal of a cellphone user for transmission to the networked controller via the wireless communicator; and
>
> a processor for accessing a communication module for enabling voice or video over Internet-Protocol streaming via the wireless communicator, the communication module comprising a user-customizable or reconfigurable software program, firmware or circuit accessible locally in the cellphone or remotely via the network, the communication module being

partitionable or uninstallable as functional component, the voice or video stream being wirelessly communicated by the wireless communicator effectively via a data channel to a wireless Internet service provider;

wherein the communication module is provided in layered or hierarchical arrangement, such that a first-level functionality is provided by a database and an object movement module, and a next-level functionality is provided by the communication module and a security module.

39. The cellphone of Claim 37 wherein:

the sensor comprises a camera capable of recording the image, audio or video signal, and recognizing the cellphone user voice or image.

43. The cellphone of Claim 37 wherein:

the wireless communicator communicates within a group of cellphones chatting privately in multi-cast mode using an embedded watermark or digital certificate, thereby securing such group communication electronically.

52. Method for cellphone communication with a networked controller comprising the steps of:

communicating by a cellphone with a networked controller via a network; and

providing a cellphone location, and an image, audio, or video signal of a cellphone user to the networked controller;

wherein the cellphone accesses a communication module for enabling voice or video over Internet-Protocol streaming, the communication module comprising a user-customizable or reconfigurable software program, firmware or circuit accessible locally in the cellphone or remotely via the network, the communication module being partitionable or uninstallable as functional component, the voice or video stream being wirelessly communicated effectively via a data channel to a wireless Internet service provider;

wherein the communication module is provided in layered or hierarchical arrangement, such that a first-level functionality is provided by a database and an object movement

module, and a next-level functionality is provided by the communication module and a security module.

54. The method of Claim 52 wherein:
the cellphone user voice or image is recognized from the image, audio or video signal.

The Examiner relies on the following prior art references to show unpatentability:

| | | |
|---|---|---|
| David | US 5,441,047 | Aug. 15, 1995 |
| Uppaluru | US 5,915,001 | Jun. 22, 1999 |
| Heiskari | US 5,930,723 | Jul. 27, 1999 |
| DeLorme | US 5,948,040 | Sep. 7, 1999 |
| Joao | US 6,047,270 | Apr. 4, 2000 |
| Rudrapatna | US 6,052,598 | Apr. 18, 2000 |
| Hollenberg | US 6,091,956 | Jul. 18, 2000 |
| McGregor | US 6,243,574 B1 | Jun. 5, 2001 |
| Kennedy | US 6,301,480 B1 | Oct. 9, 2001 |
| Almeida | US 6,356,758 B1 | Mar. 12, 2002 |

The Final Rejection mailed on October 13, 2005 set forth the following rejections of claims 37-66 on appeal:

1. Claims 37, 38, 42, 44, 52-54, 57, and 59 stand rejected as being unpatentable under 35 U.S.C. § 102(e) as being anticipated by DeLorme.
2. Claim 39 stands rejected as being unpatentable under 35 U.S.C. § 103(a) over DeLorme in view of Hollenberg.
3. Claims 43 and 58 stand rejected as being unpatentable under 35 U.S.C. § 103(a) over DeLorme in view of Heiskari.

4. Claims 40, 41, 55 and 56 stand rejected as being unpatentable under 35 U.S.C. § 103(a) over DeLorme in view of Joao.
5. Claims 45 and 60 stand rejected as being unpatentable under 35 U.S.C. § 103(a) over DeLorme in view of McGregor.
6. Claims 46 and 61 stand rejected as being unpatentable under 35 U.S.C. § 103(a) over DeLorme in view of Rudrapatna.
7. Claims 47, 48, 62, and 63 stand rejected as being unpatentable under 35 U.S.C. § 103(a) over DeLorme in view of Kennedy.
8. Claims 49 and 64 stand rejected as being unpatentable under 35 U.S.C. § 103(a) over DeLorme in view of David.
9. Claims 50 and 65 stand rejected as being unpatentable under 35 U.S.C. § 103(a) over DeLorme in view of Uppaluru.
10. Claims 51 and 66 stand rejected as being unpatentable under 35 U.S.C. § 103(a) over DeLorme in view of Almeida.

Appellants submitted Appeal Briefs on August 17, 2006 and November 29, 2006. On January 29, 2007, the Examiner mailed a Notification of Non-Compliant Appeal Brief. Appellants submitted an Amended Appeal Brief on February 9, 2007 (hereinafter referred to as the "Brief" or "Br.").

## GROUPING OF CLAIMS

Only those arguments actually made by Appellants have been considered in this decision. Arguments that Appellants could have made but chose not to make in the brief have not been considered. *See* 37 C.F.R. § 41.37(c)(1)(vii).

While the Final Rejection rejects the 30 claims on appeal over nine prior art references in 10 prior art rejections, Appellants' Amended Brief only argues the patentability of four groupings of claims as follows:

1. The patentability of claims 37 and 52 over DeLorme in the Argument section Ai on pages 8-11 of the Amended Brief;
2. The patentability of claim 54 over DeLorme in the Argument section Aii on pages 11 and 12 of the Amended Brief;
3. The patentability of claim 39 over DeLorme and Hollenberg in the Argument section B on pages 12 and 13 of the Amended Brief, and
4. The patentability of claims 43 and 58 over DeLorme and Heiskari in the Argument section C on page 14 of the Amended Brief.

Appellants do not argue dependent claims 38, 40-42, 44-51, 53, 55-57, and 59-66 separately nor explain why these claims are believed to be separately patentable. Rather, Appellants repeat the same arguments for claims 37 and 52. See, for example, Argument section Aiii on page 12 of the Amended Brief, and Arguments D to J on pages 15-26 of the Amended Brief. Therefore, for purposes of this appeal, dependent claims 38, 40-42, 44-51, 53, 55-57, and 59-66 stand or fall with the patentability of independent claims 37 and 52. *See* 37 C.F.R. § 41.37(c)(1)(vii).

The issues raised on appeal are:

1. Did the Examiner err in rejecting claims 37 and 52 as being unpatentable under 35 U.S.C. § 102(e) over DeLorme? This issue turns on whether DeLorme teaches the communication module recited in claims 37 and 52.
2. Did the Examiner err in rejecting claim 54 as being unpatentable under 35 U.S.C. § 103(a) over DeLorme? This issue turns on

whether DeLorme teaches the cellphone user voice or image being recognized from an image, audio or video signal, as required in claim 54.

3. Did the Examiner err in rejecting claim 39 as being unpatentable under 35 U.S.C. § 103(a) over DeLorme in view of Hollenberg. This issue turns on whether DeLorme or Hollenberg teach image or voice recognition capabilities required in claim 39, and whether the combination of DeLorme and Hollenberg is proper.
4. Did the Examiner err in rejecting claims 43 and 58 as being unpatentable under 35 U.S.C. § 103(a) over DeLorme and Heiskari? This issue turns on whether DeLorme and Heiskari teach a group of cellphones chatting privately in multi-case mode using an embedded watermark or digital certificate.

## OPINON

### *Claims 37 and 52*

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros., Inc. v. Union Oil Co. of California* , 814 F.2d 628, 631 (Fed. Cir. 1987). Analysis of whether a claim is patentable over the prior art under 35 U.S.C. § 102 begins with a determination of the scope of the claim. The properly interpreted claim must then be compared with the prior art.

On pages 4 and 5 of the Examiner's Answer, the Examiner set forth factual findings where DeLorme teach every element of claims 37, 38, 42,

44, 52-54, 57, and 59. Appellants do not traverse or challenge these factual findings of the Examiner, except for the following language in independent claims 37 and 52:

> the communication module comprising a user-customizable or reconfigurable software program, firmware, or circuit accessible locally in the cellphone or remotely via the network, the communication module being partitionable or uninstallabe as functional component (Amend. Br. 8)

During patent examination, the pending claims must be given their broadest reasonable interpretation "consistent with the specification." *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). The following interpretation of the "communication module" in claims 37 and 52 on appeal takes into consideration the repeated use of alternative language in these claims. Specifically, the communication module includes one member from Groups I and II below:

Group I

(a) a user-customizable software program accessible locally in the cell phone,

(b) a user-customizable software program accessible remotely via the network,

(c) a reconfigurable software program accessible locally in the cell phone,

(d) a reconfigurable software program accessible via the network,

(e) a user-customizable firmware accessible locally in the cell phone,

(f) a user-customizable firmware accessible remotely via the network,

(g) a reconfigurable firmware accessible locally in the cell phone,

(h) a reconfigurable firmware accessible via the network,

(i) a user-customizable circuit accessible locally in the cell phone,

(j) a user-customizable circuit accessible remotely via the network,

(k) a reconfigurable circuit accessible locally in the cell phone, or

(l) a reconfigurable circuit accessible via the network, and

Group II

(a) a partitionable as functional component, or

(b) an uninstallable as functional component.

Accordingly, the communication module in claims 37 and 52 on appeal includes one of (a) to (l) for Group I and one of (a) and (b) for Group II. Furthermore, the present Specification defines that software (e.g., 66) encompasses an object and map database structure (e.g., 161), a database (e.g., 162), and other similar data structures (Spec. Figs 1, 3; p. 11-14).

We find that the Examiner has established a factual finding where DeLorme teaches the communication module in the claims on appeal, and we are not persuaded by Appellants' arguments that the Examiner erred. Appellants admit that DeLorme teaches a computerized system for travel information queries and provides the user with maps, travel directions and supplemental text, audio or graphics about specific locations or points of interest (Amend. Br. 9). Appellants further admit that DeLorme allows a user to carry out a travel planning session and creates an individualized travel plan in response to user input of 1) WHERE? (Places), 2) WHAT?/WHO? (Topics), 3) WHEN? (Times), and/or 4) HOW TO GO & HOW MUCH COST? (Accounts) at column 16, lines 60-65 (Amend. Br. 9). The Examiner concurs with these positions (Ans. 5). However, Appellants argue that DeLorme does not teach a "user-customizable or reconfigurable software program" as claimed on appeal.

As discussed above, the communication module in claims 37 and 52 on appeal includes any one of 12 items of (a) to (l) for Group I and

Appellants' Specification explains that software encompasses an object and map database structure or a database. Based thereon, we find no error in the Examiner's factual finding that DeLorme teaches a user-customizable or reconfigurable software program, as broadly defined as the communication module on appeal (Ans. 5). Namely, the individualized travel plan taught by DeLorme is a user-customizable or reconfigurable software program (e.g., object and map database structure or a database) that encompasses the communication module on appeal. Accordingly, DeLorme teaches Group I of the communication module.

Concerning the communication module of the previously-defined Group II, Appellants argue that DeLorme does not disclose, either expressly or inherently, the partitionable or uninstallable and updatable software components of modules (Amended Br. 9-11). The Examiner finds that DeLorme at column 7, line 22 to column 9, line 2 and column 10, lines 10-18 teaches, among other things, a replace function for updating the electronic maps and TRIPS (Travel Reservation and Information System) which corresponds to uninstalling software and updating software (e.g., database), as required for Group II of the communication module. Further, DeLorme teaches transferring all or a part (i.e., partitioning) of the output from a TRIPS travel planning session to another computer (col. 16, ll. 32-59). Accordingly, DeLorme teaches Group II of the communication module as claimed on appeal.

For these reasons, we affirm the Examiner's §102(e) rejection of claims 37, 38, 42, 44, 52-54, 57, and 59 as anticipated by DeLorme. For similar reasons and because "anticipation is the epitome of obviousness," *Connell v. Sears, Roebuck & Co.*, 722 F.2d 1542, 1548 (Fed. Cir. 1983), we

affirm the Examiner's §103 rejections of claims 40, 41, 44-53, 55, 56, and 59-66 over DeLorme and any of Joao, McGregor, Rudrapatna, Kennedy, David, Uppaluru, and Almeida.

*Claim 54*

With respect to claim 54, Appellants argue that the claimed limitation "the cellphone user voice or image is recognized from the image, audio or video signal" is not found in the Examiner's rejection of claim 54 on appeal. Claim 54 also uses alternative language that broadens the claim to define alternative functions or structures, only one of which need be present in the prior art to anticipate the claim limitation. For example, the limitation in claim 54 is met by a cellphone having voice recognition. As noted by the Examiner on page 16 of the Answer, DeLorme discloses various portable devices can perform the functions of the wireless communication unit (WCU) (907 in Fig. 9), e.g. a notebook or laptop personal computer, a personal digital assistant or PDA, a "smart" cellular phone, two-way pager, an "accessorized" GPS sensor, as well as a dedicated or specially manufactured appliance, and so forth--provided that the device includes appropriate embedded and/or attached elements (col. 75, ll. 33-45). Further, the WCU, such as a cellphone, includes voice recognition (col. 77, ll. 50-59). Accordingly, DeLorme teaches the limitation of claim 54 on appeal.

For these reasons, we find no error in the Examiner's finding that DeLorme anticipates the limitations in claim 54 on appeal.

*Claim 39*

In rejecting claims under 35 U.S.C. §103, it is incumbent upon the Examiner to establish a factual basis to support the legal conclusion of obviousness. *See In re Fine*, 837 F.2d 1071, 1073 (Fed. Cir. 1988). In so doing, the Examiner must make the factual determinations set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966).

Appellants argue that the language of claim 39 requires image *and* voice recognition capabilities and apparently neither DeLorme nor Hollenberg teaches the combination of these capabilities. Appellants acknowledge that Hollenberg discloses a digital camera for recording image and video information, and DeLorme discloses voice recognition functions (Amend. Br. 12-13). We conclude that Appellants admit that either DeLorme or Hollenberg teaches the limitations of claim 39.

Appellants' claim interpretation is wrong. Appellants argue that claim 39 requires image *and* voice recognition capabilities. Appellants incorrectly use the conjunction "and" here. Claim 39 uses the conjunction "or" between some of the listed capabilities or functions of the camera. Accordingly, claim 39 is encompassed by a digital camera for recording image and video information as taught by Hollenberg or a device having voice recognition functions as taught by DeLorme.

We are not convinced by the Appellants' arguments that the combination of DeLorme and Hollenberg is improper. As explained by the Examiner, DeLorme and Hollenberg teach communications between a mobile unit and a remote location with video, audio, and text information, together with various substitutions, modifications, changes, and omissions thereto (DeLorme Fig. 9; Hollenberg Figs. 1, 4) (Ans. 19-20). These are

sufficient reasons for one of ordinary skill in the art to combine the suggested teachings of DeLorme and Hollenberg to make the claimed invention obvious. In *KSR Int'l Co. v. Teleflex, Inc.*, 127 S. Ct. 1727 (2007), the Supreme Court emphasized the need to account for common sense when considering whether a combination of references would have been obvious: "[c]ommon sense teaches, however, that familiar items may have obvious uses beyond their primary purposes, and in many cases a person of ordinary skill will be able to fit the teachings of multiple patents together like the pieces of a puzzle." *Id.* at 1742.

For the above reasons, either Hollenberg or DeLorme anticipate claim 39 on appeal or a combination of Hollenberg and DeLorme make this claim obvious. Accordingly, we affirm the Examiner's rejection of claim 39.

*Claims 43 and 58*

Claims 43 and 58 on appeal require a "group of cellphones chatting privately in multi-case mode using an embedded watermark or digital certificate." These claims were rejected over DeLorme and Heiskari. The Examiner acknowledges that DeLorme does not teach a group of cell-phones chatting privately in multi-cast mode using an embedded watermark or digital certificate, as required in claims 43 and 58 on appeal. The Examiner cites column 6 together with Figs. 5 and 6 of Heiskari as teaching a wireless communicator (radiophones, M1, M2) that communicates within a group of cell-phones chatting in multi-case mode (IDENTIFIER OF CALL GROUP) using an embedded watermark or digital certificate (name, number, or address), thereby securing such group communication electronically (Ans.

7). The Examiner notes that mobile communication systems often include especially private mobile radio systems used by the authorities (Ans. 7).

We cannot find a factually sufficient disclosure of using an embedded watermark or digital certificate within Heiskari. The terms watermark and digital certificate have established meanings in the art, which are not encompassed by the showings in Figs. 5 and 7 and the accompanying disclosure in Heiskari. For example, it is well known that an embedded watermark is an invisible watermarking, which is information added as digital data to audio, picture or video, but which cannot be perceived as such. An application of digital watermarking could be where two parties communicate a secret message embedded in a digital signal. On the other hand, digital certificates are specialized computer security methods that comprise public-key cryptography technology that are attestations by a certificate authority as to the pairing of identification and public key information. Such an embedded watermark or digital certificate is not found or described in Figs. 5 and 7 and the accompanying disclosure in Heiskari.

For these reasons, the Examiner has not established that a group of cellphones chatting privately in multi-case mode using an embedded watermark or digital certificate is known in the art. Accordingly, the skilled artisan could not have found it obvious to include a group of cellphones chatting privately in multi-case mode using an embedded watermark or digital certificate from Heiskari in the method and structure proposed by DeLorme, because Heiskari does not disclose or suggest this limitation.

In conclusion, the Examiner failed to establish a factual basis for the embedded watermark or digital certificate limitation on appeal,

which is necessary to support the legal conclusion of obviousness. *Fine* at 1073. Therefore, we reverse the rejection of claims 43 and 58 as being unpatentable under 35 U.S.C. § 103(a) over DeLorme in view of Heiskari.

## CONCLUSION

1. The Examiner's decision rejecting claims 37, 38, 42, 44, 52-54, 57, and 59 as being unpatentable under 35 U.S.C. § 102(e) over DeLorme is affirmed.
2. The Examiner's decision rejecting claim 39 as being unpatentable under 35 U.S.C. § 103(a) over DeLorme in view of Hollenberg is affirmed.
3. The Examiner's decision rejecting claims 43 and 58 as being unpatentable under 35 U.S.C. 103(a) over DeLorme in view of Heiskari is reversed.
4. The Examiner's decision rejecting claims 40, 41, 55, and 56 as being unpatentable under 35 U.S.C. 103(a) over DeLorme in view of Joao is affirmed.
5. The Examiner's decision rejecting claims 45 and 60 as being unpatentable under 35 U.S.C. 103(a) over DeLorme in view of McGregor is affirmed.
6. The Examiner's decision rejecting claims 46 and 61 as being unpatentable under 35 U.S.C. 103(a) over DeLorme in view of Rudrapatna is affirmed.

7. The Examiner's decision rejecting claims 47, 48, 62, and 63 as being unpatentable under 35 U.S.C. 103(a) over DeLorme in view of Kennedy is affirmed.
8. The Examiner's decision rejecting claims 49 and 64 as being unpatentable under 35 U.S.C. 103(a) over DeLorme in view of David is affirmed.
9. The Examiner's decision rejecting claims 50 and 65 as being unpatentable under 35 U.S.C. 103(a) over DeLorme in view of Uppaluru is affirmed.
10. The Examiner's decision rejecting claims 51 and 66 as being unpatentable under 35 U.S.C. 103(a) over DeLorme in view of Almeida is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED-IN-PART

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

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*Ex parte* DENNIS SUNGA FERNANDEZ and IRENE HU FERNANDEZ

Appeal 2008-1056
Application 09/823,508
Technology Center 2600

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Decided: September 3, 2008

Before KENNETH W. HAIRSTON, JOHN A. JEFFERY, and R. EUGENE VARNDELL, JR., *Administrative Patent Judges*.

VARNDELL, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Appellants appeal under 35 U.S.C. § 134 from the Examiner's rejection of claims 68-73. We have jurisdiction under 35 U.S.C. § 6(b). We reverse.

The invention claimed on appeal relates to a method including vendor and buyer processors for coupling a fixed vendor and a mobile buyer over a network (Org. Cl. 18). The invention includes determining the location of the mobile buyer, receiving a transaction message from the mobile buyer, and sending a transaction message to the mobile buyer identifying the fixed vendor (Org. Cl. 18). Among other things, the invention includes software automatically enabling video surveillance of the mobile buyer by the software having adaptive personal-image visual recognition ability automatically to provide computer-implemented visual recognition indication of a personal image of the mobile buyer (Spec 28-30).

Claim 68, which further illustrates the invention, follows:

> 68. In a network for coupling at least one fixed vendor processor to at least one mobile buyer processor, a method for transacting between vendor and buyer processors, the method comprising the steps of:
>
> determining a first location of a mobile buyer processor coupled to a network;
>
> receiving from the mobile buyer processor a first transaction message; and
>
> sending to the mobile buyer processor a second transaction message indicating a first fixed vendor processor proximately disposed to the first location, wherein the second transaction message is caused to be sent adaptively by software that matches a mobile buyer interest with a fixed vendor service or product by using past movement or location pattern of the mobile buyer, thereby facilitating local transaction efficiently between the mobile buyer and a nearby vendor, the second transaction message indicating real-time inventory and location-based pricing of service or product of interest to the mobile buyer available at the nearby vendor, the software providing access by the vendor processor to a video surveillance of the mobile buyer, *thereby automatically enabling such video surveillance of the mobile buyer to be performed automatically*

> *by the software having adaptive personal-image visual recognition ability automatically to provide computer-implemented visual recognition indication of a personal image of such mobile buyer*, the software being partitioned modularly or layered hierarchically in a first core component comprising a database, and a next functional component comprising a transaction module, whereby one or more software agent functions cooperatively with or uses the first core or next functional component to enable extended or integrated network transaction between vendor and buyer processors.

(Emphasis added).

Hereinafter, the above-italicized limitation in independent claim 68, which is also required in independent claims 70 and 72, will be referred to as the "personal-image recognizing limitation."

The Examiner relies on the following prior art references to show unpatentability:

| | | |
|---|---|---|
| Fan | US 5,959,577 | Sep. 28, 1999 |
| Hollenberg | US 6,091,956 | Jul. 18, 2000 |
| Kennedy, III | US 6,301,480 | Oct. 9, 2001 |

The Final Rejection mailed on July 12, 2006 set forth the following rejections:

1. Claims 68, 70, and 72 stand rejected as being unpatentable under 35 U.S.C. § 103(a) over Fan in view of Hollenberg.
2. Claims 69, 71, and 73 stand rejected as being unpatentable under 35 U.S.C. 103(a) over Fan in view of Hollenberg in further view of Kennedy.

Rather than repeat the arguments of Appellants or the Examiner, we refer to the Appeal Brief filed on March 22, 2007 and the Examiner's Answer mailed on May 29, 2007.

Appellants collectively argue independent claims 68, 70, and 72 together (Br. 9-11). Appellants also collectively argue dependent claims 69, 71, and 73 together (Br. 11-12). Arguments which Appellants could have made but did not make in their Appeal Brief have not been considered and are deemed to be waived. *See* 37 C.F.R. § 41.37(c)(1)(vii).

## OPINION

In rejecting claims under 35 U.S.C. §103, it is incumbent upon the Examiner to establish a factual basis to support the legal conclusion of obviousness. *See In re Fine*, 837 F.2d 1071, 1073 (Fed. Cir. 1988). In so doing, the Examiner must make the factual determinations set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966).

### *Claims 68, 70, and 72*

The Examiner explains that Fan teaches all limitations in independent claims 68, 70, and 72 with the exception of the personal-image recognizing limitation. (Ans. 3-6). Appellants do not challenge these factual findings of the Examiner (Br. 9-12). The Examiner acknowledges that Fan does not teach or suggest the personal-image recognizing limitation in the claims on appeal (Ans. 6). The Examiner argues that Hollenberg teaches this limitation (Ans. 6, 7, 9, 10).

The issue on appeal is whether Hollenberg teaches the personal-image recognizing limitation in the claims on appeal, and if so, whether one of ordinary skill in the art would have found it obvious to include the personal-image recognizing limitation within the teachings of Fan.

The Examiner cites Hollenberg at column 8, lines 7-24; column 9, lines 15-23; and column 29, line 60 to column 30, line 3 as teaching the personal-image recognizing limitation in the claims on appeal (Ans. 6-7). However, we cannot find a factually sufficient disclosure of the personal-image recognizing limitation within Hollenberg. At best, Hollenberg proposes a situational information system where digital photographs or video recordings of traffic congestion and emergency-situation information could be transmitted with camera and communication capabilities (col. 8, ll. 7-24). However, this is not a teaching of the personal-image recognizing limitation required in the claims on appeal. In other words, Hollenberg does not teach or suggest "automatically enabling such video surveillance of the mobile buyer to be performed automatically by the software having adaptive personal-image visual recognition ability automatically to provide computer-implemented visual recognition indication of a personal image of such mobile buyer," as required in the claims on appeal.

For these reasons, the Examiner has not established that the personal-image recognizing limitation claimed on appeal is known in the art. Therefore, the skilled artisan could not have found it obvious to include the personal-image recognizing limitation from Hollenberg in the method and structure proposed by Fan, because Hollenberg does not disclose or suggest this limitation.

In conclusion, the Examiner failed to establish a factual basis for the personal-image recognizing limitation on appeal, which is necessary to support the legal conclusion of obviousness. *Fine* at 1073. Therefore, we reverse the rejection of claims 68, 70, and 72 as

being unpatentable under 35 U.S.C. § 103(a) over Fan in view of Hollenberg.

*Claims 69, 71, and 73*

Claims 69, 71, and 73 respectively depend from claims 68, 70, and 72, and thereby include the personal-image recognizing limitation on appeal. Fan does not teach the personal-image recognizing limitation (Ans. 6). As discussed above, Hollenberg does not teach the personal-image recognizing limitation. The Examiner does not rely on Kennedy as teaching the personal-image recognizing limitation. Accordingly, for the same reasons set forth above for claims 68, 70, and 72, we reverse the rejection of claims 69, 71, and 73 as being unpatentable under 35 U.S.C. 103(a) over Fan in view of Hollenberg in further view of Kennedy.

CONCLUSION

The Examiner's decision rejecting claims 68, 70, and 72 as being unpatentable under 35 U.S.C. § 103(a) over Fan in view of Hollenberg is reversed. Similarly, the Examiner's decision rejecting claims 69, 71, and 73 as being unpatentable under 35 U.S.C. 103(a) over Fan in view of Hollenberg in further view of Kennedy is reversed.

REVERSED

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